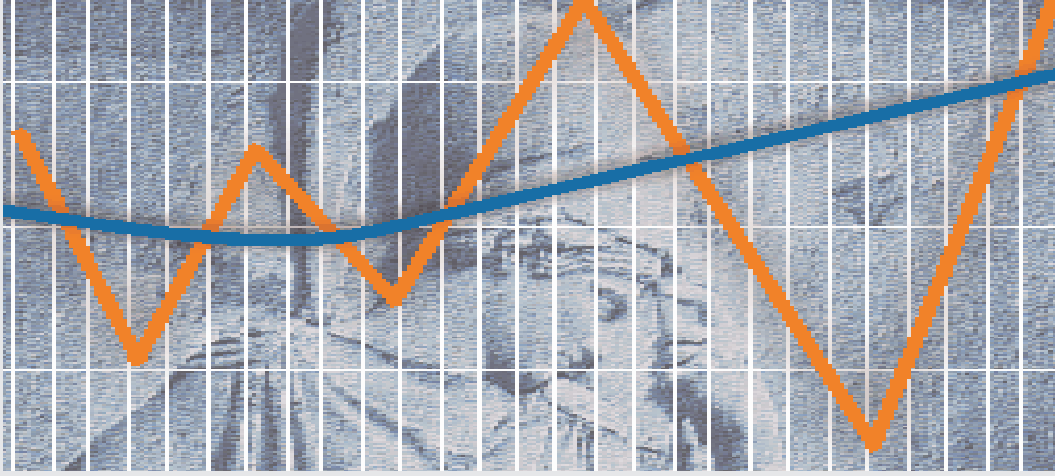

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ifo Beiträge zur Wirtschaftsforschung

Studies on Issues in Political Economy since the Global Financial Crisis

Kai Jäger

ifo Institut

Leibniz-Institut für Wirtschaftsforschung
an der Universität München e.V.

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Preface

This dissertation was prepared by Kai Jäger while he was working at the Ifo Institute. It was completed in June 2016 and accepted as a doctoral thesis by the Department of Economics at the University of Munich in November 2016. It includes four studies broadly connected to the causes and consequences of the Global Financial Crisis of 2007-8 from a political economy perspective.

Chapter 2 analyzes the political roots of massive foreign reserves accumulation, which has contributed to the American credit boom before the financial crisis. The study shows that elections tend to explain why democracies have acquired less foreign reserves than authoritarian regimes. Basel III was a regulatory consequence of the Global Financial Crisis, which is scheduled to impose liquidity requirements as a prudential measure for commercial banks. Chapter 3 examines whether these liquidity requirements could have an unintended negative effect on monetary stability. Based on a new dataset of reserve and liquidity requirements, the results show that inflation is more robust to changes in the velocity of money if reserve and liquidity requirements are low. Increases in the velocity of money are associated with higher inflation rates if reserve and liquidity requirements are high. The ability of partisan politics to shape economic policies according to ideological goals has been regularly questioned in an era of globalization and austerity. Chapter 4 suggests that government ideology still has a pronounced impact on economic policy-making based on a sample of OECD and new EU member states. Chapter 5 analyzes why major business leaders in France and Germany have publicly supported the euro in the weeks before a bailout program got enacted by the European Council in July 2011. The study shows that direct corporate interest did not appear to matter. Instead, business leaders appeared to be more likely to join the campaign if they were well-connected in business and political networks. The findings suggest that managers disregarded their short-term economic interest to improve their long-term ties with political decision-makers.

Keywords: Financial Crisis, Political Economy, Foreign Reserves, Political Business Cycle Theory, Veto Players, Basel III, Reserve Requirements, Money Demand, Price Stability, Partisan Politics, Economic Freedom, Euro, Rent-Seeking, Lobbying, Social Network Analysis.

JEL-Codes: D72, D85, E5, E41, F31, H1, H5.

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In addition to Professor Potrafke, I would also like to thank my colleagues at the Ifo Institute, who made my short stay in Munich pleasant: Manuela Krause, Marina Riem, Philipp Kaiser, Björn Kauder, Pepe, Markus Reischmann, Christoph Schinke, Horst Schwemmer, and our team assistant Sabine Kolbinger.

I would also like to express my deep gratitude to Jeff Friedman and Jeff Hummel from whom I have learnt a lot. I am also grateful to the Institute of Humane Studies and the Charles Koch Foundation for their generous financial support throughout my graduate career.

Last but not least, I would like to thank my family and friends for their love and support.

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Kai Jäger

Referent: Prof. Dr. Niklas Potrafke

Korreferent: Prof. Michael C. Munger, Ph.D.

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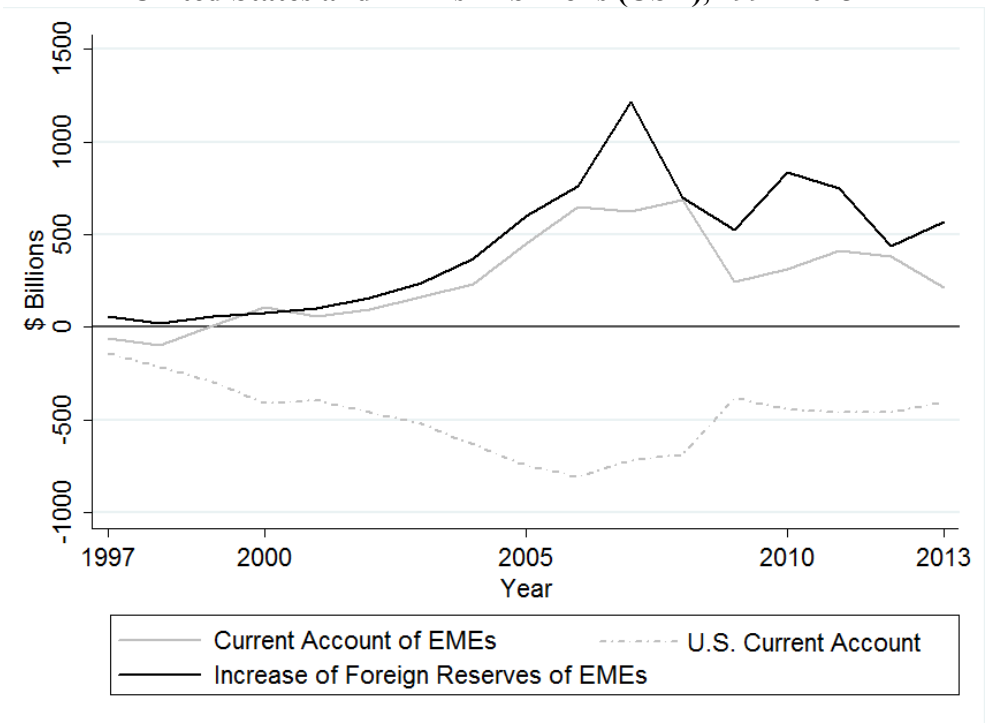
Chapter 1

Introduction

The financial crisis of 2007-8 is often considered the worst financial turmoil since the Great Depression of the 1930s. Major financial intermediaries collapsed or required government bailouts. The crisis gave rise to an unprecedented global economic recession and contributed to the emergence of the European Debt Crisis (Helleiner 2011).

The causes of the financial crisis have been debated controversially by economists. The explanations for its origin range from too much government regulation to too little government activity; some scholars emphasize the monetary policy by the Federal Reserve, while others highlight the moral hazard in the banking system, the complexity of financial innovations, or a combination of several factors (see Friedman 2010 for an overview).

Figure 1.1: Change of foreign reserves in EMEs and current accounts of the United States and EMEs in billions (USD), 1997-2013



Note: EMEs as defined by the IMF World Economic Outlook Database

Another explanation for the advent of the financial crisis is the global savings glut hypothesis. Several scholars (e. g., Wolf 2008; Obstfeld and Rogoff 2009; Portes 2009; Roubini 2009; Krugman and Wells 2010; Bernanke et al. 2011) contend that low long-term interest rates and the current account deficit in the United States were the result of massive inflows of capital from abroad, most notably from China and other developing countries. The global imbalance contributed to the financial crisis because it has fuelled U.S. capital markets with cheap credit, thereby creating the conditions that gave rise to the housing market bubble.[1]

According to the savings glut hypothesis, developing countries achieved a current account surplus by buying foreign securities, such as U.S. government bonds. Figure 1.1 shows the aggregated increase in foreign reserves of 142 emerging and developing countries (EMEs) and compares the aggregated current account of EMEs with the U. S. current account in billions U.S. dollar over the period 1997-2013. Foreign reserves and the current account surplus of EMEs increased steadily until they reached their peak in 2007; vice versa, the U. S. current account deficit approximated this development. While the disparity between the current accounts and the investment in foreign reserves declined to some degree in the aftermath of the financial crisis of 2007-8, they persisted to be sizeable.

The "intriguing development" of substantial foreign reserves accumulation in combination with the proliferation of flexible exchange rate regime rates is a "puzzling phenomenon" (Aizenman 2007: 56). Consequently, scholars debate the economic reasons for the surge in foreign reserves that has contributed to global imbalances, distinguishing

[1] An alternative hypothesis to the savings glut is the so-called money glut hypothesis. Critics of the savings glut hypothesis, such as Taylor (2009) or Laibson and Mollerstrom (2010), claim that the decline in world interest rates cannot be explained by a savings glut because world savings have continuously declined as a share of world GDP since the 1970s. It was rather the low federal funds rate by the Federal Reserve that caused low interest rates. While a detailed discussion of the money glut hypothesis is beyond the scope of this introduction, there are at least three shortcomings of the money glut hypothesis in comparison with the savings glut hypothesis. First, the focus on the level of world savings conceals the fact that deficit spending of governments has increased while savings have declined in high income countries since the 1970s. Figure 1.1 shows that savings have increasingly exceeded investment in emerging markets since the Asian Financial Crisis as reflected in the massive current account surplus. Second, the money glut hypothesis requires an expansionary monetary policy, but the growth of the monetary base, which is directly under the control of the Federal Reserve, has been moderate in the USA prior to the crisis (Henderson and Hummel 2008). Third, Wolf (2008: 109-10) points out that according to the money glut hypothesis, the current account surplus of emerging markets would have been the result of extraordinary money creation in the USA, which stimulated exports in the periphery. But this perspective assumes passive actors in the developing world. However, policy-makers in the periphery have actively embraced foreign reserves accumulation to embark on an export-led growth strategy and to protect their markets from current account deficits (Corden 2009; Mendoza 2010).

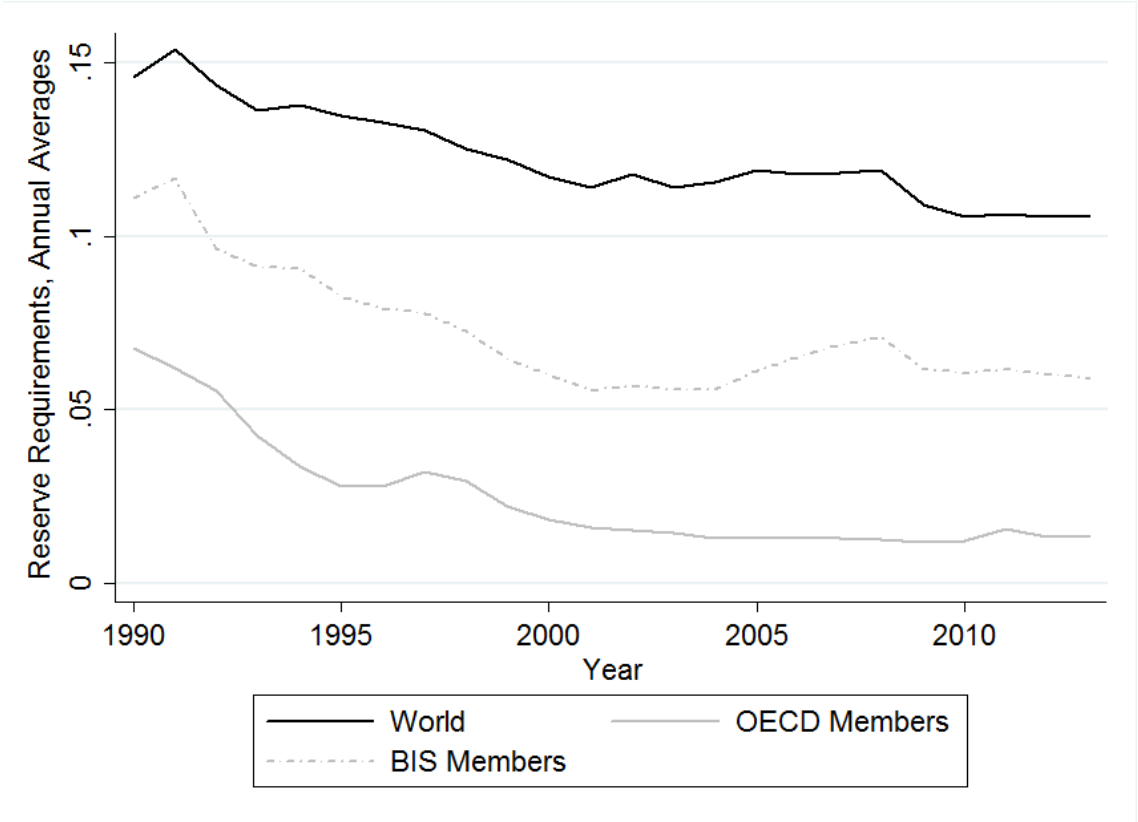
between a self-insurance motive against currency or financial crises and an export-led growth strategy (Corden 2009).

Chapter 2 steps into the debate on foreign reserves by highlighting that the current economic explanations ignore the political dimension. Reserves accumulation has costs and generates distributional winners and losers. Thus, acquiring reserves should be easier if the political economy framework insulates policy-makers from bearing the political cost of investing in foreign reserves. A focus on the political environment also seems to be necessary because authoritarian regimes increasingly outperformed democracies in reserves accumulation since the Asian Financial Crisis (Figure 2.1). A time-series cross-sectional analysis of up to 182 countries over the period 1990-2013 shows that elections appear to be the institutional characteristic that caused democracies to have relatively fallen behind in reserves accumulation. Following the logic of the political business cycle theory (Nordhaus 1975; Tufte 1978), foreign reserves can be depleted strategically before an election in order to postpone a currency depreciation or to create a short-term monetary boom (Dreher and Vaubel 2009; Walter 2009; Walter and Willett 2012). A democratic election is associated with a reduction in reserves as a percentage of GDP of 0.5 to 1.1 percent, or 7.5 percent to one quarter of a standard deviation.

Policy prescriptions in response to the financial crisis have received a similar prominent attention as the discussion of the causes. “The most important bit of reform” was the third installment of the Basel Accords by the Basel Committee on Banking Supervision, scheduled for complete implementation by 31 March 2019 (Chwieroth 2011). A novelty of the Basel III regulations are liquidity requirements as an important prudential measure for banks. Similar to reserve requirements, banks are required to maintain highly liquid assets, such as government bonds, to the extent that they would be able to meet their 30-day net cash outflows.

As shown by Figure 1.2, reserve and liquidity requirements, measured as annual averages, have declined worldwide over the period 1990-2013, particularly for OECD countries and for member states of the Bank for International Settlements (BIS), which are required to introduce the Basel Accords. Reserve requirements in the OECD have already been low in the 1990s and have continued to fall to an average of under 2 percent. Increased global competition and innovations in the financial sector played an important role for the global reduction of reserve requirements (Di Giorgio 1999; VanHoose and Humphrey 2001). Moreover, the use of reserve and liquidity requirements as tool for central banks to conduct monetary policy has retired to the background in advanced economies (McLeay et al. 2014).

Figure 1.2: Comparative development of reserve requirements, 1990-2013



Note: Based on own data collections.

As a consequence, neither the monetary implications of Basel III nor the impact of the reduction of reserve requirements on monetary outcomes have been discussed in the literature. Chapter 3 suggests that this omission could be unwarranted: Since the 1990s, central banks in advanced economies increasingly achieved stable inflation rates – much to the surprise of the late Milton Friedman (2003). Unanticipated changes in the velocity of money have contributed to inflation volatility, but as velocity tended to be stable over time, scholars have focused on the money supply as the key factor for determining inflation. But this changed in the 1990s; velocity behaved erratically with strong upward and downward deviations from its long-term trend (Berentsen et al. 2015; Lucas and Nicolini 2015). The instability of velocity gives rise to what I label *Friedman's Conundrum*: Why did central banks achieve price stability exactly when velocity started to misbehave? Or, to put it differently, why did central bankers succeed in predicting changes in velocity, exactly when velocity became more erratic?

Chapter 3 proposes that the reduction of reserve requirements is the answer to *Friedman's Conundrum*. While the profit-seeking incentive of depository institutions ensures that any fractional banking system tends to offset changes in velocity, the magnitude of

this endogenous offsetting effect depends on the level of reserve and liquidity requirements. Inside money increases exponentially for any percentage point decrease in reserve requirements according to the money multiplier model. The banking sector thus can only offset changes in velocity sufficiently if reserve requirements are low or non-existent, leading to an inflation rate that is more robust to unexpected changes in velocity. Based on a unique dataset on reserve requirements for 168 countries over the period 1990-2013, I show that low reserve requirements ensure that (1) the banking sector can offset changes in velocity, and (2) that the inflation rate is robust to changes in velocity. The findings of Chapter 3 also have implications for the additional liquidity requirements which will be imposed by Basel III in the future: Volatility in inflation rates could return as an unintended consequence of Basel III – a possibility that still needs to be addressed in the discussion on the prudential qualities of the third Basel Accord.

The financial crisis of 2007-8 has also negatively affected the public budget of national governments. Many governments had to bail out their financial sector and faced rising social cost as a consequence of surging unemployment rates in the aftermath of the economic downturn. They were forced to conduct market reforms such as cutting back welfare expenditures, initiate privatizations, and deregulate labor markets in order to accommodate bond market investors. Rodrik (2010) summarizes that "many [governments] are driven to undertake structural reforms that they don't really believe in – just because it would look bad to markets to do otherwise."

A cornerstone of democratic legitimacy is that political parties compete on programmatic appeals and are accountable to their voters. The traditional partisan hypothesis suggests that parties polarize on a left-right dimension. Left-wing parties would enact expansionary policies, while right-wing parties support free-market policies, providing voters with reliable party labels and a distinctive choice at the ballot box. The pressure to reform suggests that governments could have limited abilities to fulfill their election promises, which would be problematic for democratic governance (Rodrik 2011; Scharpf 2014). Funke et al. (2016)'s historical study of financial crises over the period 1870-2014 also implies that financial crises limit the abilities of governments to enact policies, but as the result of a different mechanism: In the elections after financial crises, the majority of the government tends to plummet while radical or new parties are thriving. The increased parliamentary fractionalization leads to political gridlock, reducing the probability of government parties to enact their manifestos.

Already since the 1990s, several empirical studies suggest that the influence of government ideology has declined; the partisan effect has not disappeared completely, "but

certainly became less pronounced" in OECD countries (Potrafke 2016), suggesting that the financial crisis of 2007-8 has not caused but rather amplified an existing trend in Western political systems. Chapter 4 contributes to the vast literature on partisan politics by studying government ideology for 36 OECD or new European Union (EU) member states over the pre- and post-crisis period 2000-2012 with two innovations: First, most studies focus on one particular policy area, such as welfare spending, labor market regulation, or privatization to make claims on the validity of the partisan hypothesis. Chapter 4 utilizes the Economic Freedom of the World Index to provide a unified measurement across many areas of economic policies.

Second, Chapter 4 takes into account that a partisan effect has indeed disappeared for policy areas that have witnessed programmatic convergence by mainstream parties or have been delegated to external agencies such as independent central banks or the EU. A modified economic freedom index only includes those areas which are still under the realm of the national government and provokes partisan disagreement. The empirical analysis of the study suggests that government ideology still matters in the early 21st century: Left-wing governments are associated with relatively lower economic freedom scores in comparison to their right-wing counterparts, suggesting that the economic left-right dimension is still a guiding principle for partisan politics. A unit change in Government Ideology towards the left reduces the annual average changes of economic freedom by 0.19 to 0.36 points, or 5.7 to 10.7 percent of a standard deviation. Replacing a hegemonic right-wing with a hegemonic left-wing government that controls all cabinet posts is associated with a reduction in changes in economic freedom by about 0.76 to 1.44 points, or by 22.6 to 43 percent of a standard deviation.

The ongoing European Debt Crisis was another major outcome of the financial crisis of 2007-8. In May 2010, Greece was the first member of the Eurozone to request financial aid. The Greek debt crisis subsequently affected Ireland, Portugal, and Cyprus, and threatened to spread to other highly indebted Eurozone members. The European Debt Crisis gave rise to the creation of an institutionalized rescue fund, the temporary European Financial Stability Facility (EFSF), which was succeeded by the permanent European Stability Mechanism (ESM). On July 21, 2011, the European Council decided to keep crisis-ridden Greece in the Eurozone and support it with additional €109 billion, the autonomy of the EFSF to intervene on the bond market and its funding were increased, and the repayment of loans was extended.

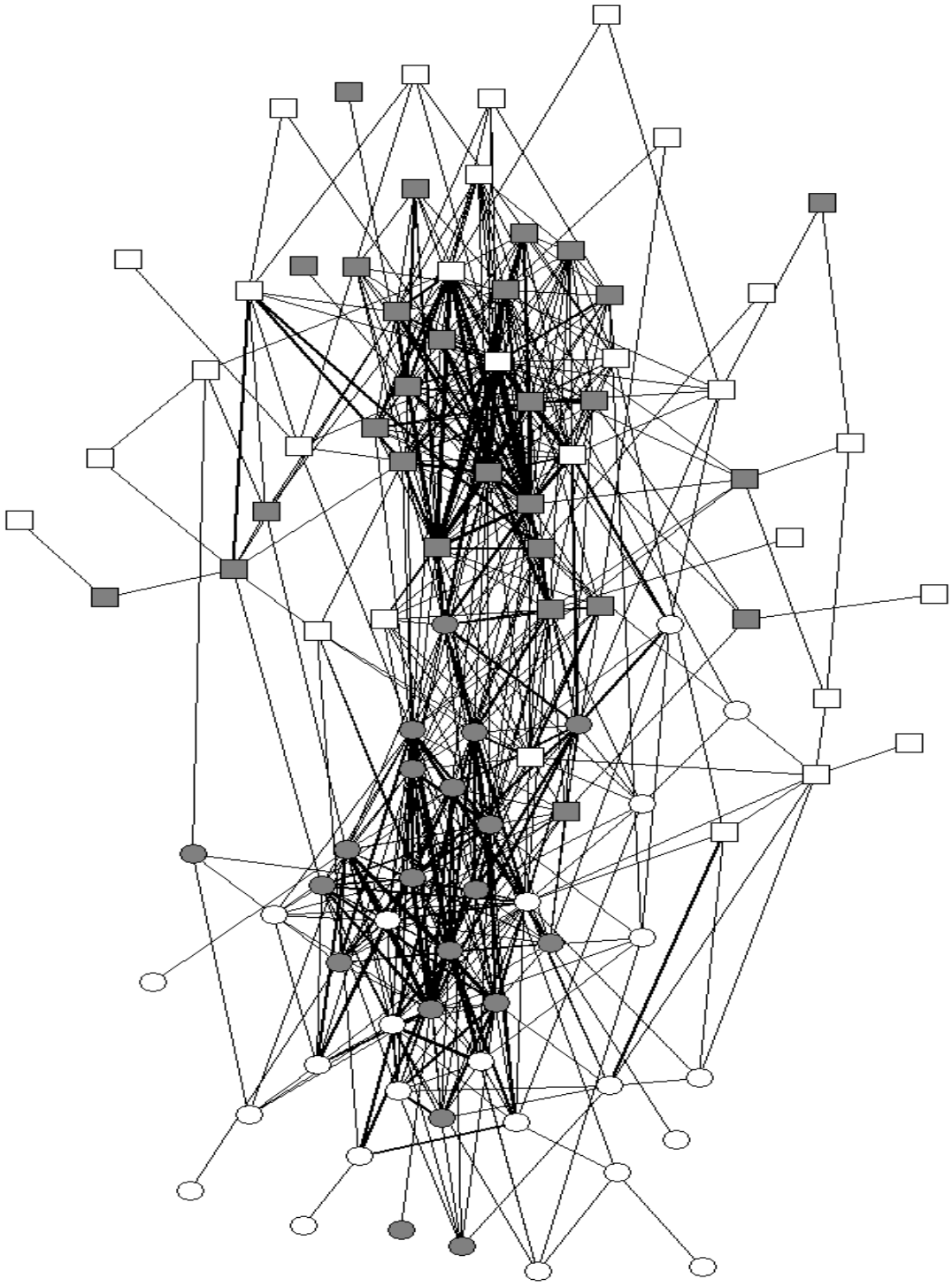
What preceded the decision by the European Council was an advertising campaign by 51 representatives of major French and German corporations in favor of the euro with a

package of policy proposals, which came close to the rescue measures by the European Council in July 2011. Chapter 5 evaluates why Franco-German business leaders supported the euro in a common campaign. Lobbying or rent-seeking by corporations or interest groups has been a major research field in political science and economics, particularly within the public choice framework (Stigler 1971; Mitchell and Munger 1991; Bouwen 2002). Firms are assumed to have an incentive to engage in the political arena if the benefits of favorable government policies achieved by rent-seeking exceed the cost of lobbying. The rent-seeking incentive suggests that CEOs supported the euro rescue measures because their corporations were expected to benefit from it.

Figure 1.3 shows the network of French and German CEOs based on interlocking directorates in firms and other business and extra-business organizations. We can see that connections are unequally distributed among business leaders. There is a small inner circle of business leaders who are well connected in the business world. Figure 1.3 also shows that support among business leaders for the euro appears to be more prevalent in the inner circle than in the periphery of the network. Proponents of the social network approach argue that the interest of business leaders is shaped by their social environment. The well-connected inner circle is expected to be more sensible to the interest of the business community and of political elites (Useem 1984; Mizruchi 1996), suggesting that corporate leaders were more likely to join the pro-euro campaign when they were better connected.

The empirical analysis of Chapter 5 suggests that the economic interest of their firms did not make business leaders more likely to join the pro-euro campaign. Instead, the social connections in the business and political world significantly increased the probability of business leaders to publicly support the euro. Increasing the network centrality score for business and extra-business networks from its mean by one standard deviation is associated with a 40.1 percent higher probability that business leader supported the euro. The probability increases to about 86 percent if business leaders also had a political career and received an Order of Merit. The results of Chapter 5 suggest that social connections provided CEOs with information to transcend their narrow firm interest, and gave them an incentive to improve their long-term political capital with pro-euro political elites by publicly supporting the euro.

Figure 1.3: Business network of French and German CEOs in 2011



Note: A circle indicates a CEO of a German corporation of the DAX 30 and M-DAX 50, a square a CEO of a French corporations of CAC 40 and CAC Next 20. CEOs in gray signed the pro-euro campaign. Interlocking directorates denote connections. CEOs without connections are not shown. The position of the CEO in the Franco-German network is generated by UCINET based on network centrality measurement. The network is based on own data collections.

The chapters of the dissertation relate to issues in political economy that are broadly connected to the financial crisis of 2007-8. Chapter 2 examines the institutional environment that made an unprecedented accumulation of foreign reserves possible, which in turn was on important contributor to global imbalances particularly before the financial crisis. The prospective liquidity requirements of the third installment of the Basel Accords are a direct policy response to the financial crisis. Chapter 3 suggests that the liquidity requirements could have negative effects on monetary stability. Chapter 4 evaluates whether government ideology still influences economic policies in the pre- and post-crisis period of the early 21st century. Chapter 5 examines the reasons of why big business elites in France and Germany mutually supported a euro rescue program in the ongoing European Debt Crisis. The concluding remarks of Chapter 6 summarize the results of the dissertation.

References

Aizenman, Joshua. 2007. "Comments and Discussion." *Brookings Papers on Economic Activity* 8(1): 56-67.

Berentsen, Aleksander, Samuel Huber, and Alessandro Marchesiani. 2015. "Financial innovations, money demand, and the welfare cost of inflation." *Journal of Money, Credit and Banking* 47(S2): 223-261.

Bernanke, Ben, Carol C. Bertaut, Laurie DeMarco, and Steven B. Kamin. 2011. "International capital flows and the return to safe assets in the united states, 2003-2007." *FRB International Finance Discussion Paper* 1014.

Bouwen, Pieter. 2002. "Corporate lobbying in the European Union: the logic of access." *Journal of European Public Policy* 9(3): 365-390.

Chwieroth, Jeffrey. 2011. "The crisis in global finance: political economy perspectives on international financial regulatory change." In: Center for International Affairs, (corp. ed.): *Beyond national boundaries: building a world without walls*. Seoul: Academy of Korean Studies Press.

Corden, W. Max. 2009. "China's exchange rate policy, its current account surplus and the global imbalances." *The Economic Journal 119*(541): F430-F441.

Di Giorgio, Giorgio. 1999. "Financial development and reserve requirements." *Journal of Banking & Finance* 23(7): 1031-1041.

Dreher, Axel, and Roland Vaubel. 2009. "Foreign exchange intervention and the political business cycle: A panel data analysis." *Journal of International Money and Finance* 28(5): 755-775.

Friedman, Jeffrey (ed.). 2010. *What Caused the Financial Crisis.* Philadelphia: University of Pennsylvania Press.

Friedman, Milton. 2003. "The Fed's Thermostat." *Wall Street Journal*, August 19.

Funke, Manuel, Moritz Schularick, and Christoph Trebesch. 2016. "Going to extremes: Politics after financial crises, 1870–2014." *European Economic Review*, forthcoming.

Helleiner, Eric. 2011. "Understanding the 2007-2008 global financial crisis: Lessons for scholars of international political economy." *Annual Review of Political Science* 14: 67-87.

Henderson, David R. and Jeffrey R. Hummel. 2008. "Greenspan's Monetary Policy in Retrospect – Discretion or Rules?." *Cato Institute Briefing Paper* 109: 1-12.

Krugman, Paul, and Robin Wells. 2010. "The Slump Goes On: Why?." *The New York Review of Books*, September 30.

Laibson, David, and Johanna Mollerstrom. 2010. "Capital flows, consumption booms and asset bubbles: A behavioural alternative to the savings glut hypothesis." The *Economic Journal* 120(544): 354-374.

Lucas, Robert E., and Juan Pablo Nicolini. 2015. "On the stability of money demand." *Journal of Monetary Economics 73: 48-65.*

McLeay, Michael, Amar Radia, and Ryland Thomas. 2014. "Money creation in the modern economy." Pp. 14-27 in: Bank of England: *Quarterly Bulletin: Q1*. London: Bank of England.

Mendoza, Ronald U. 2010. "Was the Asian crisis a wake-up call?: Foreign reserves as self-protection." *Journal of Asian Economics* 21(1): 1-19.

Mitchell, William C., and Michael C. Munger. 1991. "Economic models of interest groups: An introductory survey." *American Journal of Political Science* 35(2): 512-546.

Mizruchi, Mark S. 1996 "What do interlocks do? An analysis, critique, and assessment of research on interlocking directorates." *Annual Review of Sociology* 22: 271-298.

Nordhaus, William D. 1975. "The political business cycle." *Review of Economic Studies* 42(2): 169-190.

Obstfeld, Maurice, and Kenneth Rogoff. 2009. "Global Imbalances and the Financial Crisis: Products of Common Cause." Pp. 131-72 in: Reuven Glick and Mark M. Spiegel (eds.): *Asia and the Global Financial Crisis*. San Francisco: Federal Reserve Bank of San Francisco.

Portes, Richard. 2009. "Global Imbalances." Pp. 19-26 in: Mathias Dewatripont, Xavier Freixas and Richard Portes (eds.): *Macroeconomic Stability and Financial Regulation: Key Issues for the G20*. London: Centre for Economic Policy Research.

Potrafke, Niklas. 2016. "Partisan Politics: The empirical evidence from OECD panel studies." Working paper, ifo Institute.

Rodrik, Dani. 2010. "The Market Confidence Bugaboo." *Project Syndicate*, July 12.

Rodrik, Dani. 2011. *The globalization paradox: democracy and the future of the world economy*. Cambridge: Cambridge University Press.

Roubini, Nouriel. 2009. "A Balanced Global Diet." *New York Times*, 28 January.

Scharpf, Fritz W. 2014. "Comment: The Eurocrisis as a Victory of Neoliberalism?" Pp. 143-154 in: John Erik Fossum, and Agustín José Menéndez (eds.): *The European Union in Crises or the European Union as Crises?*. Oslo: ARENA Centre for European Studies.

Stigler, George J. 1971. "The Theory of Economic Regulation." *The Bell Journal of Economics and Management Science* 2(1): 3-21.

Taylor, John B. 2009. "The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong." NBER Working Paper No. 14631.

Tufte, Edward R. 1978. *Political Control of the Economy.* Princeton: Princeton University Press.

Useem, Michael. 1984. *The Inner Circle*. New York: Oxford University Press.

VanHoose, David D., and David B. Humphrey. 2001. "Sweep accounts, reserve management, and interest rate volatility." *Journal of Economics and Business* 53(4): 387-404.

Walter, Stefanie. 2009. "The limits and rewards of political opportunism: How electoral timing affects the outcome of currency crises." *European Journal of Political Research* 48(3): 367-396.

Walter, Stefanie, and Thomas D. Willett. 2012. "Delaying the inevitable: A political economy approach to currency defenses and depreciation." *Review of International Political Economy* 19(1): 114-139.

Wolf, Martin. 2008. *Fixing Global Finance*. Baltimore: Johns Hopkins University Press.

Chapter 2

The Role of Regime Type in the Political Economy of Foreign Reserve Accumulation

Abstract[2]

Authoritarian regimes have surpassed democracies in foreign reserve accumulation since the Asian Financial Crisis. Two prominent institutionalist theories could explain this diverging trend in reserves: First, the political business cycle theory, suggesting that reserves are reduced before an election. Second, the veto player theory, implying that a high number of veto players increases the de facto independence of central bankers, who are reluctant to invest in reserves. A time-series cross-sectional analysis for up to 182 countries over the period 1990-2013 shows that democratic governments tend to reduce their reserves before elections. While veto players do not affect reserves directly, a high number of veto players tends to limit a political business cycle before an election. Elections and veto players do not have an influence in authoritarian regimes. Election cycles tend to explain why democracies have relatively fallen behind in a period of massive reserve accumulation.

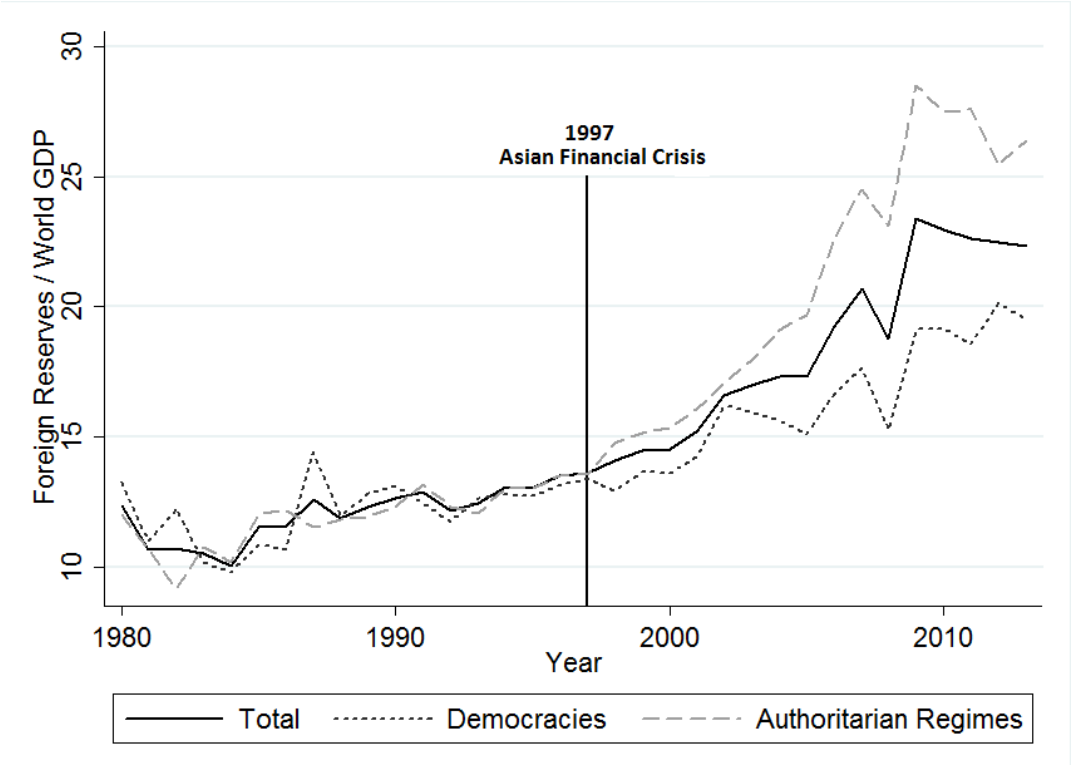
[2] This chapter is based on my publication "The Role of Regime Type in the Political Economy of Foreign Reserve Accumulation." *European Journal of Political Economy* 44: 79-96.

2.1 Introduction

The savings glut hypothesis has become a popular explanation for the global financial crisis and for persistent global imbalances. The former chair of the Federal Reserve, Ben Bernanke (2005), initially proposed the savings glut hypothesis in order to claim that the roots of the American current account deficit are external: Massive capital inflows from mostly developing countries fueled American capital markets with cheap credit, leading to declining real interest rates.

The fact that net capital flows from developing to developed countries is a "paradox" (Summers 2006). Neoclassical theory suggests that capital should move from capital-abundant developed countries to emerging markets, where it is relatively scarce. Yet, the interaction of market demand and supply could not have caused this paradox exclusively. Foreign-exchange interventions by governments were a major driving force behind the savings glut (Wolf 2008: 55-7). Figure 2.1 shows that the world has witnessed a steady increase in foreign reserves held by governments since the mid-1990s, and a further accelerating trend in the first decade of the 21st century.

Figure 2.1: Development of global foreign reserves, 1980-2013



Note: A country qualifies as democracy if Polity-IV score or the imputed score by Freedom House is 7 or above.

The literature highlights two explanations for the recent surge in reserves: self-insurance and mercantilist motives (Corden 2009). First, accumulating a large pile of foreign reserves allows governments to support the financial system in a situation of financial distress. Holding a large war chest of reserves provides a self-insurance mechanism, which reduces the probability of suffering balance-of-payment or financial crises (Feldstein 1999). Second, countries could acquire reserves to promote an export-led growth strategy. Without full sterilization, the national currency depreciates if governments sell their national currency for foreign reserves in the foreign exchange market. In turn, the undervalued exchange rate bolsters the competitiveness of the export sector (Dooley et al. 2004).

Most research on the determinants of reserve accumulation focuses on macroeconomic variables to reveal whether the self-insurance or the mercantilist motive prevails (Lane and Burke 2001; Jeanne 2007; Aizenman and Lee 2007, 2008; Bastourre et al. 2009; Cheung and Qian 2009; Mendoza 2010; Obstfeld et al. 2010; Delatte and Fouquau 2012; Aizenman et al. 2015). But including only economic factors implicitly assumes that reserve accumulation is a choice variable regardless of the political environment. Political institutions, however, cannot be ignored because acquiring reserves is costly and has distinctive distributional effects. Hence, reserve accumulation is easier with an institutional framework that insulate policy-makers from bearing the political cost of reserve accumulation.

A fundamental institutional element of any polity is the regime type. Figure 2.1 also shows that authoritarian governments have outperformed democracies in reserves accumulation since the 1997 Asian Financial Crisis. This article examines the role of regime type in explaining the surge in reserve accumulation and aims to answer the question:

Why were increases in foreign reserves smaller in democracies relative to authoritarian regimes?

The prominent political business cycle and the veto player theories could provide the causal mechanisms to explain why democracies have relatively fallen behind.

The political business cycle theory contends that incumbents have an incentive to use state resources, such as monetary or fiscal policies, before an election to manipulate short run economic outcomes in order to improve their chances of re-election (Nordhaus 1975; Tufte 1978). Reserves qualify for such a political business cycle, because they could be used in the short term for monetary expansion, to avoid a currency depreciation, or to

distribute clientelistic goods (Dreher and Vaubel 2009; Walter 2009; Walter and Willett 2012; Aidt et al. 2015). Thus, reserves should be negatively associated with an upcoming election.

Institutional constraints, however, could thwart the manipulation attempts by incumbents. Central banks are in charge of managing reserves, and they have increasingly become de jure independent to pursue low inflation rates (Arnone et al. 2007; Crowe and Meade 2008). As an increase in reserves tends to induce inflationary pressures, independent central bankers should be reluctant to strongly invest in reserves (Shih and Steinberg 2012).

But independent central banks do not operate in a political vacuum. Central bankers cannot completely ignore the demands of the government, because incumbents can influence the central bank through candidate selection and irregular dismissals. Keefer and Stasavage (2003) argue that the influence of elected politicians on central bankers is conditional on effective institutional checks and balances. The presence of multiple veto players makes it more difficult for incumbents to replace central bankers, which, in turn, enhances the capacity of central bankers to conduct an independent monetary policy. The number of veto players should constrain incumbents from initiating a political business cycle in reserves before an election, but veto players should also be associated with lower levels of reserves in non-election times because they ensure the de facto independence of inflation-averse central bankers.

Both political business cycle and veto player theories suggest that democracies will be associated with relatively lower foreign reserves. Yet, the recent literature on authoritarian institutions highlights that elections and parliaments are not distinctive characteristics of democracies anymore: A growing number of authoritarian regimes adopts quasi-democratic institutions that empirically foster regime survival (Geddes 1999; Gandhi and Przeworski 2007; Wright 2008; Gandhi and Lust-Okar 2009; Gehlbach and Keefer 2011; Boix and Svolik 2013; Jensen et al. 2014).

The political business cycle and veto player theories would also explain reserve accumulation in authoritarian regimes if the regime uses elections to achieve supermajorities through economic manipulation, and if binding authoritarian legislatures allow the regime to credibly commit to secure property rights. But if authoritarian elections and institutional checks and balances are indeed binding as in democracies, institutional characteristics fail to explain the divergence between democracies and authoritarian regimes in accumulating reserves.

A time-series cross-sectional analysis of up to 182 countries over the period 1990-2013 appears to show that democratic governments tend to significantly reduce their reserves before an election. Democratic veto players do not influence reserves directly but constrain a political business cycle before an election. To the contrary, no electoral business cycle is found in authoritarian regimes, and authoritarian veto players do not appear to systematically constrain reserve accumulation.

The results suggest that reserve accumulation cannot be fully captured by macroeconomic considerations alone. Reserves are systematically influenced by different regime types and institutional settings. One democratic election accounts for a reduction in reserves as a percentage of GDP of 0.5 to 1.1 percent, or 7.5 percent to one quarter of a standard deviation. Thus, election cycles tend to explain why democracies acquire relatively fewer reserves during a period in which reserve accumulation has become a salient issue in international political economy.

The article is organized as follows: The next section discusses the motives behind the recent surge in reserves, and the underlying cost of reserve accumulation, suggesting that acquiring reserves is not a choice variable but influenced by political institutions. Section 3 introduces the political business cycle and veto player theories for democracies and authoritarian regimes to explain reserve accumulation. Section 4 is devoted to the empirical analysis, and Section 5 concludes that election cycles in democracies tend to explain why non-democracies have surpassed democracies in reserve accumulation.

2.2 The benefits and cost of foreign reserve accumulation

2.2.1 The motives for acquiring foreign reserves: Precautionary and mercantilist motives

Under the Bretton-Woods system, foreign reserves were required to intervene in the exchange rate market to uphold the fixed exchange rate to the US dollar (Heller 1966; Kelly 1970). The optimal reserves ratio was considered to be a function of a country's import propensity. The traditional rule of thumb suggested that reserves should equal the quantity of three months of imports (Rodrik 2006: 255). When the Bretton Woods system collapsed in 1973, economists expected that reserves would decline because governments increasingly adapted a flexible exchange rate (Bastourre et al. 2009: 863-5). But the reduction in reserves did not occur; governments were not indifferent to exchange rate fluctuations, and they required reserves to influence the value of their currencies (Delatte and Fouquau 2012: 166).

The re-emergence of financial globalization "led to new thinking on the role of international reserves in a financially globalized world" (Obstfeld et al. 2010: 60). Since the mid-1990s, the developing world experienced a series of systematic financial crises with massive capital outflows: The Mexican Peso Crisis of 1994-95, the Asian Financial Crisis of 1997-98, Russia in 1998, Brazil in 1999, Turkey in 2001, and Argentina in 2002.

Accumulating foreign reserves can help to avoid such crises. The advantage of this self-insurance strategy is that governments are endowed with a "large war chest" to uphold currency stability in a financial turmoil (Feldstein 1999). A large pile of reserves reduces the probability of suffering a balance-of-payment crisis and the necessity to apply for IMF loans (Obstfeld et al. 2010: 60). The crises of the 1990s were a "wake-up call" for the developing world, as countries with large reserves holding did not experience a current account deficit, and were relatively more successful in avoiding severe financial distress in the 1990s (Mendoza 2010; Bussière et al. 2015). The Guidotti-Greenspan rule incorporates the self-insurance motive by proposing that the optimal level of reserves holding should equal all external debts that are due next year (Greenspan 1999).

However, the accumulation of reserves has reached higher levels in many developing countries than suggested by the Guidotti-Greenspan rule. As a consequence, Dooley et al. (2004: 308) argue that the surge in reserves also has a mercantilist dimension: Governments acquire reserves to promote an export-led growth strategy. If governments sell their national currency for foreign reserves in the foreign exchange market, they put pressure on their national currency to depreciate – unless they sterilize the purchase. Therefore, investing in foreign reserves leads to an undervalued real exchange rate, which improves the competitiveness of exports. Especially China seems to have adopted the export-led growth strategy. Their pile of reserves has considerably outreached the amount of reserves that is sufficient for precautionary reasons (Steinberg and Shih 2012).

Corden (2009: F435-7) combines both approaches by arguing that developing countries practice "exchange rate protection" to avoid balance-of-payment crises and to boost economic growth through an undervalued currency. Accumulating reserves ensures that developing countries "smoke but do not inhale" in global capital markets (Wolf 2008: 3). But the practice also has a beggar-thy-neighbor effect. The more countries use reserves to protect their economy, the less the desired negative effect on the exchange rate, requiring an even stronger investment in reserves to achieve the objective. As a consequence, the accelerating global reserve accumulation has contributed to a devaluation race and global imbalances (Blanchard and Milesi-Ferretti 2010).

Table 2.1: The world's largest and smallest holders of foreign reserves in 2013

Rank	Country	Reserves/GDP in 2013	Reserves/GDP in 2000	Democracy
1.	Libya	182.7	35.9	No
2.	Hong Kong SAR	112.9	62.7	No
3.	Lebanon	107.9	49.1	No
4.	Saudi Arabia	99.1	11.1	No
5.	Algeria	95.8	24.7	No
6.	Singapore	91.9	84.6	No
7.	Taiwan	81.5	32.2	Yes
8.	Switzerland	78.2	19.7	Yes
9.	Bhutan	55.7	72.3	No
10.	Botswana	51.6	109.2	Yes
19.	China	40.9	14.3	No
53.	Japan	25.8	7.6	Yes
168.	Pakistan	3.3	2.8	Yes
169.	Guinea	2.9	5.6	No
170.	United States	2.7	1.2	Yes
171.	Greece	2.4	11.2	Yes
172.	Slovak Republic	2.2	15.0	Yes
173.	Slovenia	1.9	15.7	Yes
174.	Luxemburg	1.6	0.5	Yes
175.	Estonia	1.3	16.2	Yes
176.	Ireland	0.7	5.4	Yes
177.	Sudan	0.3	1.1	No

Note: A country qualifies as democracy if Polity IV score or the imputed score by Freedom House is 7 or above.

Table 2.1 shows the world's largest and smallest holders of reserves measured as a percentage of GDP for 2013. Although China has surpassed Japan in 2006 as the world's largest holder of foreign reserves in absolute terms, neither China nor Japan reach the Top Ten of this ranking. The ranking reveals that eight out of ten of the largest holders are non-democracies, while the proportions are reversed for the smallest holders.

2.2.2 Cost and distribution effects of acquiring foreign reserves

There are several costs for governments to acquire reserves. If a central bank buys reserves, the national currency will be sold in the foreign exchange market. The investment yields a downward pressure on the national currency's exchange rate and an upward pressure on inflation. In order to dampen inflation, the central bank has to sterilize the purchase of foreign reserves by selling domestic government securities.

Whether sterilization attempts are successful depends on how the banking system channels domestic bonds: Sterilization prevents inflation if domestic government bonds

are held by households or firms. If financial intermediaries hold government bonds, they have more assets on their balance sheet, which enables them to expand the money supply through credit creation. (Kumhof 2004; Mohanty and Turner 2006: 47; Jones 2009: 68). Credit creation could also lead to financial imbalances or asset bubbles, if the banking system channels credit disproportionally into some sectors such as the housing market (Gourinchas et al. 2001). As a countermeasure, governments could impose regulations that render financial intermediation less efficient, and encourages the use of non-market instruments. Examples of such measures are reserve requirements, taxes on earned interest, and credit controls (Mohanty and Turner 2006: 49-50; Cook and Yetman 2012).

Sterilization also has direct costs if there is a negative spread between the interest earned on foreign reserves and the interest paid on domestic bonds. For instance, the interest payments on the Monetary Stabilization Bonds by the Bank of Korea (BoK) was higher than the interest that the BoK earned on foreign reserves in 2004, yielding an annual loss of about US$130 million for the BoK (Pineau et al. 2006: 17).

Moreover, holding reserves comes with the opportunity cost that governments cannot invest these resources in alternative assets. Rodrik (2006) estimates that the opportunity cost of holding excess reserves beyond the Guidotti-Greenspan rule sum up to about 1 percent of the GDP for all developing countries; Summers's (2006) calculation even reaches 1.85 percent. Both estimations are based on alternative long-term assets that would earn higher returns. Consequently, less resources are available for popular projects such as spending on public education or welfare (Klein and Cukier 2009: 11; Allen and Hong 2011: 21-2).

Lastly, reserve accumulation generates distributional winners and losers. The immediate effect of foreign reserve accumulation is a "crowding out" of domestic investment: domestic savings are channeled abroad, causing a higher domestic interest rate (Reinhart et al. 2016). The winners are export-oriented industries if reserve accumulation leads to an undervalued exchange rate (Frieden 1991). By contrast, an undervalued exchange rate negatively affects domestic consumers, as the price of imported consumer goods increases; the competiveness of non-tradable sectors also deteriorates since they have to compete with export-oriented sectors for labor (Corden 2009: F435). The financial sector is also among the losers: Reserve accumulation is associated with stronger inflationary pressures and requires sterilization, which often leads to stricter financial market regulation, negatively affecting the profitability of the financial sector.

The costs of acquiring reserves imply that political constraints play a key role in influencing a country's reserves holding. Even if policy-makers want to respond to a macroeconomic outcome with an increase in reserves, they might not have the support of relevant political players. Furthermore, policy-makers might have to invest in alternative resources if the political opportunity costs of acquiring reserves are too high.

2.3 Institutional explanations for reserve accumulation

2.3.1 The political business cycle theory

A main difference between democracies and authoritarian regimes is that "democratization is an act of subjecting all interests to competition, of institutionalizing uncertainty" (Przeworski 1991: 14). Democratic incumbents could lose their power in elections. Dictators do not need majoritarian support at the ballot box to stay in office.

The political business cycle theory is based on these competitive and uncertain aspects of democracy (Nordhaus 1975; Tufte 1978). The political business cycle theory argues that incumbents have an incentive before an election to use monetary or fiscal policies to improve short-term economic output in order to increase their chances of re-election.

Yet, the "empirical support for the electoral-cycle idea is generally weak" (Keech 1995: 61), possibly because the original political business cycle theory was based on a closed economy model. In integrated global markets, initiating a successful political business cycle is contingent on the transparency of government decisions, i.e. the extent to which market actors can obtain verified information on the government's strategies and actions (Clark et al. 1998; De Haan and Klomp 2013: 394-5). Short-term manipulation attempts might only lead to a depreciating exchange rate, higher inflation, or higher interest rates if they are correctly anticipated by global investors. Consequently, Alt and Lassen (2006: 546) reach the conclusion that "the political budget cycle is where you can't see it."[3]

But the logic of the political business cycle theory still applies to foreign reserves, because reserves enable the government to engage in expansionary monetary policy with-

[3] This does not preclude political business cycles on the sub-national level or for unconventional policy areas (e.g., Potrafke 2010; Tepe and Vanhuysse 2014; Marinov et al. 2015; Baskaran et al. 2016; Reischmann 2016).

out affecting the national exchange rate: The central bank sells foreign currency in exchange for own central bank money, while expanding the money supply in line with the foreign monetary expansion that it has triggered (Dreher and Vaubel 2009: 756-8). Therefore, reserves function as a buffer to overcome the Impossibility Trinity in the short run because sizeable foreign reserves provide the government with some monetary autonomy in an environment of stable exchange rates and free capital flows (Aizenman et al. 2013).

Reserves can also be used to defend the exchange rate against depreciation pressures. Walter (2009) and Walter and Willett (2012) show that the "fear of floating" by governments is strong before an election. Governments would rather spend billions of their reserves in order to delay currency devaluations until the election is over. Particularly in the three months before an election, governments tend to defend their currency against mild or intermediate market pressures; and voters tend to reward governments that have successfully postponed an exchange rate devaluation (Walter 2009). For instance, the BoK used a substantial amount of its reserves to avoid devaluation until after the presidential election of December 1997. But the pressure against the Korean Won became strong enough to force the BoK to abandon their defense just one month before the scheduled election – in which the opposition celebrated a narrow victory (Walter and Willett 2012).

There are other examples of dwindling reserves before contested elections: The election cycle 2008 in Mongolia took place in an environment of polarization, mass protests and riots. The victorious government was able to postpone the depreciation of their exchange rate, but at the cost of about half the country's foreign reserves. Similarly, mass protests dominated Thai politics before the national election in February 2014. Foreign reserves fell by over six percent of the Thai GDP in 2013, while the Thai Baht remained stable against the US Dollar. The reduction in foreign reserves was even twice as high in Serbia's 2008 election year. Several news reports highlighted the depleting foreign reserves before Pakistan's critical 2013 election, which did not prevent a depreciating Rupee, although the fall accelerated after the election.

Several studies on private investment behavior also show that private investors tend to withhold long-term investments before highly uncertain elections (Rodrik 1991; Bernhard and Leblang 2006; Canes-Wrone and Park 2012; Julio and Yook 2012; Santiso 2014). Under such circumstances, foreign reserves can be used to smooth market volatility, and to foster macroeconomic stability. In the Korean case, the BoK provided about 10 billion USD in foreign reserves to the swap market in order to support banks with funding difficulties during the global financial crisis (Chung 2010).

Furthermore, reserves could be depleted before an election to directly import consumer goods for clientelistic distribution (Sachs 1989: 8; Valença 1999), or reserves could be transferred to sovereign wealth funds to stimulate overall economic activity (Schrøder and Slotsbjerg 2008). Aidt et al. (2015) show for a sample of low- and middle-income countries that M1 significantly increases in election months. Vote buying might explain this short-term monetary expansion, as it is a predominant strategy in young democracies of the developing world (Kitschelt 2000). Foreign reserves could foster the massive distribution of cash in the weeks before an election, by being used to dampen the negative impact of the monetary expansion on the exchange rate.

In sum, there are multiple reasons for governments to use foreign reserves for their short-term advantage before an election. In contract to the traditional political monetary cycle, which influences real economic variable with a time lag of up to one year, foreign reserves immediately influence the exchange rate and financial markets, and can be quickly used in the weeks before an election for clientelistic purposes. Dreher and Vaubel (2009) indeed confirm that countries significantly reduce their reserves before an election based on a sample of up to 149 democratic and authoritarian countries over the period 1975-2001. This trend is not reversed after an election. The electoral business cycle theory suggests the following hypothesis for foreign reserves:
Hypothesis 1: G*overnments will reduce their reserves before elections.*

2.3.2 The political business cycle and institutional veto players

Even if governments have a strong incentive to initiate a political business cycle, the presence of veto players in the policy-making process could constrain the discretionary power of incumbents to initiate short-term economic manipulations (Tsebelis 1995; Cox and McCubbins 2001; MacIntyre 2001; Franzese 2002).

As central banks are predominantly in charge of managing foreign reserves, central banks could stop the strategic manipulation of reserves before an election – if they enjoy de jure and de facto independence. In most countries, parliamentary majority can amend or dispose central bank laws, which regulate foreign reserves management. The development of reserves are regularly discussed and scrutinized in parliament.[4]

[4] The Japanese parliament for instance even discussed the possibility to delegate foreign reserves management to private firms (Nakamichi 2013).

The existence of veto players in the legislative chambers and in the executive could enhance the de facto independence of central bankers (Keefer and Stasavage 2003). Veto players can obstruct manipulation attempts by blocking new laws related to reserves management in the parliament, or by informally stopping measures by the government to pressure central bankers. For instance, the Singaporean constitutional reform of 1991, which introduced an elected presidency, was designed to protect Singapore's foreign reserves. The President was endowed with veto power on the appointment of top civil servants in order to ensure that the country's vast pile of foreign reserves is not depleted for opportunistic measures by a populist government (Tan 1999: 54-5).

Particularly before an election, veto players should have a strong incentive to block monetary expansion, as they are interested in gaining power. Thus, the presence of veto players leads to the following modification of the political business cycle hypothesis:
Hypothesis 2: *The ability of governments to reduce foreign reserves before an election is conditional on the absence of effective institutional veto players in the central bank, executive, and legislature.*

2.3.3 The interaction between independent central bankers and veto players

The preference of independent central bankers and their interaction with other veto players might also affect reserve accumulation in non-election times.

The literature on central bank independence understands the concept of independence in practical terms as "the central bank's ability to pursue the goal of low inflation free of political interference" (Debelle and Fisher 1994: 197).

Shih and Steinberg (2012) argue that independent central bankers should oppose accumulating a large pile of reserves, because investing in reserves creates inflationary pressures. Based on previous studies which show that the financial sector will oppose high inflation rates (e.g. Posen 1995), it is likely that interest group politics reinforce the disinclination of independent central banks to hoard reserves. The financial sector is likely to oppose high levels of reserves, because banks dislike inflationary pressures or tougher financial market regulation that are induced by reserve accumulation. The financial sector has a stronger political influence vis-à-vis the export sector if the central bank is independent: Central banks have closer ties with banking executives, and they tend to promote the interest of the financial sector. A greater degree of independence consequently expands the influence of the financial sector on monetary policy (Shih and Steinberg 2012: 861-6).

Domestic politics plays an important role for delegating monetary policy to an independent central bank (Belke and Potrafke 2012). Crowe (2008) argues that delegation is more likely with a government coalition of groups with diverse preferences, as delegation removes monetary policy from the policy arena as a potential source of intra-coalition conflict. Moreover, central bankers cannot ignore the demands of their political environment regardless of their formal independence. Even in the case of the German Bundesbank, which had the reputation of being one of the most independent central banks of the world, case studies show that incumbents have actively tried to influence monetary policy through political appointments to the Bundesbank council (Vaubel 1997a, 1997b; Lohmann 1998; Maier and De Haan 2000). De facto independence could differ from de jure independence, because politicians can try to influence monetary policies by nominating docile central bankers or by removing recalcitrant ones (Maxfield 1998; Hayo and Hefeker 2002; Dreher et al. 2008, 2010; Adolph 2013).

The de facto central bank independence might depend on effective veto players that insulate central bankers from demands of the government. Keefer and Stasavage (2003) show that inflation rates and the likelihood of replacing a central bank governor are significantly lower in the presence of legal central bank independence and multiple veto players. A high number of veto players ensures that delegating monetary policy to an independent central bank is a credible commitment.

The positive association between number of veto players and de facto central bank independence suggests that veto players should influence reserve accumulation as well. Independent central bankers should oppose high levels of foreign reserves, because high levels of reserves create inflationary pressures and distort financial markets.

Hayo and Voigt (2008) and Hielscher and Markwardt (2012) argue that de facto judiciary independence and the quality of political institutions also foster de facto central bank independence. Laws are more credible if they are enforced by a different government branch, increasing the probability that the government considers the constitutional framework as binding (Hayo and Voigt 2008: 164).

These alternative institutional channels for de facto central bank independence are not substitutes but complements for veto players. The presence of effective veto players is strongly intertwined with the rule of law and the quality of institutions. North and Weingast (1989)'s seminal historical work shows how parliamentary constraints, i.e. effective veto players, contribute to the rule of law and functioning institutions (see also

Andrews and Montinola 2004). In turn, the quality of the rule of law influences the effectiveness of veto players as well. For instance, it is less likely that formal central bank independence is enforced if the rule of law is weak. Thus, the concept of veto players also functions as a proxy for other institutional channels. This leads to the following hypothesis:

Hypothesis 3: *If the number of veto players is high, de jure independent central bankers enjoy a greater level of de facto independence. Independent central banks tend to oppose the accumulation of reserves. Thus, reserve accumulation should be negatively associated with the number of veto players.*

2.3.4 Elections and veto players in authoritarian regimes

Elections and parliamentary checks and balances are not distinctive characteristics of democracies anymore; a growing number of authoritarian regimes adopts quasi-democratic institutions. Authoritarian institutions do not qualify to be democratic, because they differ in their degree of civil liberties and fairness. Authoritarian incumbents can ensure their rule through a "menu of manipulation", such as prohibition or high entry costs for competitors, unequal access to media and legal resources, electoral fraud, shutting down the parliament, etc. (Schedler 2002).

But authoritarian institutions appear to be more than window dressing: Empirical evidence suggests that authoritarian regimes tend to survive relatively longer and have higher economic growth rates, if they are based on institutionalized parties, elections, and a parliamentary assembly (Geddes 1999; Gandhi and Przeworski 2007; Wright 2008; Gandhi and Lust-Okar 2009; Gehlbach and Keefer 2011; Boix and Svolik 2013; Jensen et al. 2014).

In fact, two theories on authoritarian institutions imply that the political business cycle and veto player theories should also apply to reserve accumulation in authoritarian regimes.

First, authoritarian elections could be a mechanism to spread spoils to voters in order to achieve genuine supermajorities at the ballot box. The incentive behind achieving supermajorities is to signal strength to regime opponents. A supermajority shows voters and political entrepreneurs that opting for the opposition is a lost cause (Magaloni 2006; Geddes 2008). Similar to democracies, such campaign efforts allow for the possibility of political business cycles. Several case studies reveal that authoritarian regimes substantially increase their social expenditures before an election that they cannot lose (Lust-Okar 2006; Magaloni 2006; Pepinsky 2007; Blaydes 2010). The signal strength theory suggests

that authoritarian incumbents have an incentive to initiate a political business cycle before an election.

Second, the cooptation theory is "the most prominent explanation linking nominally democratic institutions to regime survival" (Malesky and Schuler 2010: 482). This theory proposes that the regime uses the parliamentary arena to coopt opponents through privileges or participation in the policy-making process. The inclusion would induce opponents to invest in authoritarian institutions rather than instigating a popular rebellion (Gandhi 2008; Gandhi and Przeworski 2006, 2007). Wright (2008) claims that authoritarian rulers would establish binding legislatures to credibly constrain themselves to achieve higher economic growth. Resembling the influence of veto players in democratic institutions, the cooptation theory suggests that authoritarian institutions have a binding effect on the government.

Both signal strength and cooptation theories lead to the following hypothesis regarding the influence on foreign reserves:
Hypothesis 4: *Authoritarian institutions resemble their democratic counterparts as predicted by Hypotheses 1-3: Authoritarian rulers will reduce reserves when a national election is approaching, unless effective veto players are blocking such manipulation attempts. A high number of veto players should be associated with low reserves.*

2.4. Empirical section

2.4.1 Data description and t-test of means

The study covers 182 countries over the period 1990-2013. This time span includes the periods of major financial crises in the developing world, and the beginning of electoral authoritarianism (Levitsky and Way 2010).[5]

Foreign reserves as a ratio of GDP is the dependent variable, as in previous studies on foreign reserves. It is measured in first differences to control for autocorrelation, and to yield a stationary time series, because panel-data unit-root testing suggests non-stationarity of the reserves-to-GDP time series. In addition, the lagged level of foreign reserves as a percentage of GDP is also part of the analysis to capture converging trends. The explanatory variables that are relevant to evaluate the hypotheses of this paper are the measurements for regime type, elections, and the number of effective veto players.

[5] Table 3.5 in the appendix shows the descriptive statistics of the variables.

The Polity-IV project provides the measurement for regime type (Marshall and Jaggers 2014). The Polity-IV score is based on the openness and competitiveness of executive recruitment, access to political participation, and executive constraints. It ranges from -10 to +10, and a threshold of a Polity-IV score of 7 or higher is used to distinguish democracies from authoritarian regimes.[6] For countries that are not part of the Polity-IV dataset, the democracy score is imputed by using the average rating by Freedom House (Hadenius and Teorell 2007).

The election variables are based on national parliamentary elections in parliamentary systems and also on presidential elections in presidential systems. Pre-Election measures the share of a year in days for the twelve months before an election, whereas Post-Election measures the share for the twelve months after an election. For instance, if an election occurs on January 18, Pre-Election has the value 18/365 in period t and 347/365 in period t-1. Post-Election would be 347/365 in period t and 18/365 in period t+1, unless a new election cycle begins, in which case Post-Election ends when Pre-Election starts again. The election variables are divided into democratic elections and authoritarian elections based on a Polity-IV score of 7 or higher.

The date of an election is exogenously given, unless the government calls a snap election. In order to control for endogenously induced elections, Irregular Election measures the share of a year in days if a country holds an irregular election ahead or after its scheduled date (Hyde and Marinov 2012).

The Political Constraints Index is used to measure Veto Players within the executive and the upper and lower legislative chambers (Henisz 2000). It is lagged by one year to ensure that the measurement for veto players, which a government is facing before an election, is not conflated with post-election veto players. It is separated into democratic and authoritarian Veto Players.

The measurement for Legal Central Bank Independence is obtained from Bodea and Hicks (2015). This dataset provides the largest coverage of annual data on central bank independence currently available with a coverage of up to 82 predominantly democratic countries until 2010. An interaction term between Legal Central Bank Independence and

[6] Table 3.6 in the appendix includes further empirical analyses based on other threshold rules of 6 or higher, and 8 or higher, which are also used by the literature for defining democracies. In addition, Cheibub et al. (2010)'s dichotomous definition of democracy, ranging from 1990 to 2008, is also used.

Veto Players evaluates whether the proposed effect of Veto Players is condition on the presence of independent central banks.

An Irregular Central Bank Turnover demonstrates that the government has the power to dismiss a central bank governor (Dreher et al. 2010). Irregular central bank turnover, however, is at best a crude proxy for central bank dependence. The absence of an irregular turnover could also imply that the government does not need to replace a docile central bank governor (Plümper and Neumayer 2011: 1132). Nonetheless, irregular turnovers have become a standard in the literature, because measurements of de facto central bank independence are not readily available for an annual sample of non-OECD countries (Klomp and De Haan 2010: 594).

A t-test of means shows that democracies differ significantly at the 90 percent confidence level from non-democracies (t-value 1.90). On average, reserves have increased annually by 0.31 percentage points in democracies, while the value is 0.67 percent for authoritarian regimes.[7]

During non-election periods, however, the difference between democracies and non-democracies is not significant (t-value 0.81): Democracies increase their reserves on average by 0.52 percent, while the average is 0.69 percent for authoritarian regimes. For democracies, the difference between 0.52 percent in non-election and 0.14 percent in election periods is significant at the 95 percent level (t-value 2.09), providing first evidence for electoral manipulation of reserves in democracies. The significant difference between election and non-election periods for democracies disappears if the number of veto players is above its mean score (t-value 1.33).

An irregular central bank turnover is significantly more likely, if the number of veto players is low (t-value 3.23) or legal central bank independence is low (t-value 4.44). Periods of irregular central bank turnover also witness significantly higher reserve accumulation of 0.95 percent compared to years without a turnover of 0.40 percent (t-value 1.76) – as implied by the theories of Keefer and Stasavage (2003) and Shih and Steinberg (2012). When grouping Veto Players into a lower and a higher category, the higher cate-

[7] The figures are similar for Cheibub et al. (2010)'s democracy measurement: Democracies and authoritarian regimes increase reserves on average by 0.25 and 0.61 percent. This difference is significant at the 95 percent confidence level (t-value 2.31).

gory is associated with lower reserve accumulation, but this difference remains insignificant unless the cut-off point for the higher Veto Players category is beyond the 75 percentile. None of these significant differences can be found for authoritarian regimes.

The following dummy variables are also included in the empirical analysis as controls: Euro Membership captures membership in the European Monetary Union. Euro Membership should reduce the demand for foreign reserves as the common currency can settle intra-union trade (Hansen et al. 2011). The dummy Left Government measures whether the party of the chief executive has a left-wing policy orientation (Beck et al. 2001). Banking Crisis indicates whether a systematic banking crisis occurs in a country (Laeven and Valencia 2008, 2012), and Past Banking Crisis equals one if a country has experienced a banking crisis in the last seven years. The experience of a banking crisis might have been a "wake-up call" to invest in foreign reserves as a self-insurance mechanism (Mendoza 2010).

Macroeconomic variables, which regularly appear in foreign reserve research, are the following: Capital Openness, which is obtained from Chinn and Ito (2008), trade size as the sum of export and import as a percentage of GDP, and the current account as a percentage of GDP.

Economic Growth is a major control variable for the empirical analysis. As total GDP is part of the denominator of the dependent variable, GDP would increase disproportionally before an election if a general political business cycle exists. Such a business cycle would cause a reduction in the ratio of foreign reserves to GDP, which would be unrelated to changes in reserves. Including the annual GDP growth rate controls for this possibility, and it raises the difficulty level to confirm Hypothesis 1, because any political business cycle of reserves depletion, which affects output, cannot be fully captured by the model specification.

Another major control variable is the exchange rate regime. Several studies find a robust association between fixed exchange rates and authoritarianism (Broz 2002; Bearce and Hallerberg 2011), or at least for some types of non-democracies (Steinberg and Malhotra 2014). But this does not necessarily suggest that countries with a fixed regime also accumulate more reserves. Reserves have substantially exceeded the amount considered to be necessary for currency management in many countries. Reinhart et al. (2016) even find that "under fixed exchange rates, annual changes in reserves relative to GDP were smaller (except in the immediate vicinity of a crisis) than those observed under "floating exchange rates" since 1997." Following Steinberg and Malhotra (2014)'s classification,

the exchange rate dummy is coded as fixed, if countries have a pegged exchange rate or follow at least a narrow band of below 2 percent based on the dataset by Ilzetzki et al. (2008), which ends in 2010. The fixed exchange rate measurement is revised and extended until 2013 based on the International Monetary Fund's annual reports on Exchange Arrangements and Exchange Restrictions.

2.4.2 Empirical analysis

The time-series cross-sectional analysis is based on an ordinary least squares (OLS) regression with first differences of foreign reserves as a percentage of GDP as dependent variable. The specification includes annual time effects to adjust for common positive or negative shocks, and country fixed effects to account for country-specific time-invariant effects, such as geography, economic wealth, or natural resource endowment. Clustered standard errors at the country level account for heterogeneity.[8]

Table 2.2 shows the regression results for seven models. The first model includes only democracy as main explanatory variable. Models 2-3 add other explanatory variables, and time and country dummies. Models 4-5 divide the sample into a pre- and post-Asian Crisis period, while models 6-7 split the sample into democracies and authoritarian regimes.

The relationship between foreign reserves and democracy is significantly negative in the first model, but this relationship disappears, when the other main explanatory variables become part of the analysis. The results for the pre-election variable in models 2-3 appear to confirm the political business cycle theory: Governments tend to reduce their reserves before an election. A democratic election is associated with an average reduction of about 0.82 percent in foreign reserves as a ratio of GDP in model 3. The insignificant post-election variable suggests that the trend is not reversed after an election. Both authoritarian election variables do not turn out to be significant.

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[8] As the lagged level of the dependent variable is included, the model specification might cause a downward bias, namely the so-called Nickell bias (Nickell 1981) which, however, shrinks as T becomes larger (Judson and Owen 1999). Estimating the models without a lagged dependent variable (Table 2.8 in the appendix) and with a simple Arellano-Bond estimator and a lagged dependent variable (Table 2.9 in the appendix) shows that main results of the empirical analysis do not change, except for the pre-election dummy of the subsample of democracies with a floating exchange rate of Table 3.4, Model 2, which appears to be insignificant. Moreover, Table 2.7 in the appendix applies a generalized least squares (GLS) Prais-Winsten transformation with a first order autoregressive process (AR1), which accounts for the serial correlation of the dependent variable that measures foreign reserves as a percentage of GDP in levels. The Prais-Winsten transformation provides a robustness test for the long-term effects of election cycles on the trend-ridden reserves-to-GDP ratio (Plümper et al. 2005: 349).

When the sample is divided into the periods 1990-97 and 1998-2010, the democratic pre-election dummy appears to be negatively associated with reserves only in the latter period. This suggests that election cycles initially did not influence reserves. But since reserve accumulation has become a salient issue after the Asian Financial Crisis of 1997, election cycles tend to explain why democracies have fallen behind in accumulating reserves.

Table 2.2: OLS regression analyses to explain changes of foreign reserves as a percentage of GDP

	1 Whole Sample	2 Whole Sample	3 Whole Sample	4 1990-97	5 98-2013	6 Dem Pol >= 7	7 Auth Pol < 7
Democracy	-0.465**	0.048	1.085	2.248	0.141		
	[2.46]	[0.10]	[1.37]	[1.04]	[0.13]		
Pre-Democratic Election		-0.453**	-0.821***	-0.564	-0.917**	-1.075***	
		[1.98]	[2.96]	[1.18]	[2.40]	[4.17]	
Post-Democratic Election		-0.449	-0.428	-0.453	-0.391	-0.454	
		[1.44]	[1.36]	[1.09]	[0.96]	[1.46]	
Pre-Authoritarian Election		-0.572	-0.079	0.057	0.245		0.258
		[1.33]	[0.16]	[0.11]	[0.30]		[0.46]
Post-Authoritarian Election		-1.018	-0.498	0.047	-0.697		-0.483
		[1.43]	[0.98]	[0.09]	[1.18]		[0.87]
Irregular Election		0.020	0.109	-0.279	0.285	1.234**	-0.815
		[0.05]	[0.27]	[0.48]	[0.55]	[2.59]	[1.31]
Democratic Veto Players t-1		-1.699**	-2.210*	-2.265	-1.889	-1.115	
		[2.35]	[1.71]	[0.80]	[1.18]	[0.93]	
Authoritarian Veto Players t-1		-0.651	-0.048	0.002	-0.109		-0.357
		[0.78]	[0.04]	[0.00]	[0.08]		[0.28]
Irregular Central Bank Turnover		0.363	-0.206	0.050	-0.083	0.438	-0.914
		[1.24]	[0.38]	[0.15]	[0.12]	[0.87]	[0.95]
Euro Membership			-5.492***		-9.541***	-3.847***	
			[3.69]		[5.42]	[3.08]	
Left Government			0.162	0.208	0.536	-0.019	-0.520
			[0.66]	[0.46]	[1.21]	[0.10]	[0.69]
Banking Crisis			-1.959**	-1.258**	-2.150*	-0.610	-2.715**
			[2.19]	[2.45]	[1.70]	[1.09]	[2.13]
Past Banking Crisis			0.099	-0.718*	0.062	0.716*	-0.362
			[0.22]	[1.72]	[0.12]	[1.92]	[0.56]
Financial Openness			-0.422**	-0.048	-0.383	-0.506**	-0.152
			[2.20]	[0.22]	[1.49]	[2.27]	[0.45]
Trade Size			0.054***	0.038**	0.054***	0.024***	0.077***
			[2.98]	[2.62]	[2.65]	[2.94]	[2.67]
Current Account			0.053	0.068	0.052	0.100***	0.071
			[0.97]	[1.55]	[0.84]	[3.30]	[1.07]
Economic Growth			-0.529	-0.040	-0.797*	-0.066**	-0.715*
			[1.51]	[1.60]	[1.83]	[2.37]	[1.69]
Fixed Exchange Rate			0.743	0.991*	0.746	-0.170	2.263
			[1.11]	[1.77]	[0.88]	[0.42]	[1.65]
Level Reserves/GDP t-1	-0.041***	-0.046***	-0.223***	-0.368***	-0.230***	-0.178***	-0.236***
	[3.16]	[3.34]	[5.94]	[4.01]	[5.32]	[4.22]	[4.86]
Time Dummies	No	No	Yes	Yes	Yes	Yes	Yes
Country Dummies	No	No	Yes	Yes	Yes	Yes	Yes
Number of Countries	182	167	154	133	150	92	97
Number of Observations	4,041	3,755	3,041	911	2,130	1,697	1,344
R-squared	0.0157	0.0212	0.3389	0.3573	0.4426	0.2567	0.4327

Note: * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. Absolute t-values in brackets.

In the subsamples of democracies and authoritarian regimes, the pre-election variable turns out to be significant only in democracies. The significant coefficient of irregular elections for democracies indicates that democratic incumbents tend to be unable to initiate reserve manipulation if the election date is not exogenously given, probably because an irregular democratic election predominantly occurs shortly after a successful motion of no confidence.

All model specifications show that Eurozone membership is strongly negatively associated with reserve accumulation. This suggests that the introduction of the Eurozone in many European democracies since 1999 has contributed to the reserves disparity between democracies and authoritarian regimes.

Across all models, the democratic pre-election variable is significantly negative, whereas the post-election variable appears to be insignificant, indicating that the reduction of reserves before an election is not reversed afterwards. This appears to confirm Dreher and Vaubel (2009)'s previous results, and suggests that election cycles can explain why democracies have fallen behind in reserve accumulation. The average substantial impact is sizeable: One election year decreases reserves as a percentage of GDP by 0.5 to 1.1 percent, which equals 7.5-13.6 percent of a standard deviation in models 2-3, and up to about a quarter of a standard deviation for the democratic subsample of model 7. The substantial impact of one election is similar or higher than the quantitative effects of previous political business cycles found by Aidt et al. (2015) (about 10 percent of a standard deviation) and Dreher and Vaubel (2009), whose impact ranges from about five to nine percent of a standard deviation for the natural logarithm of foreign reserves as a percentage of trend GDP over the period 1975-2001.

King et al.'s (2000) simulation-based approach is used to obtain more evidence on the substantial impact of democratic elections. The program "Clarify" uses the results of the multiple regression analyses of the democratic and authoritarian subsamples to draw 1000 sets of simulated coefficients from each posterior distribution. This procedure ensures that differences in values are not a result of chance (Tomz et al. 2003). The post-election variable is fixed at zero, and all other explanatory variables at their means. The pre-election variable is either fixed at zero or one for democratic and authoritarian regimes respectively, yielding four counterfactual scenarios: Democracies with and without elections, and authoritarian regimes with and without elections.

Figure 2.2: Simulated effects on changes in reserves/GDP

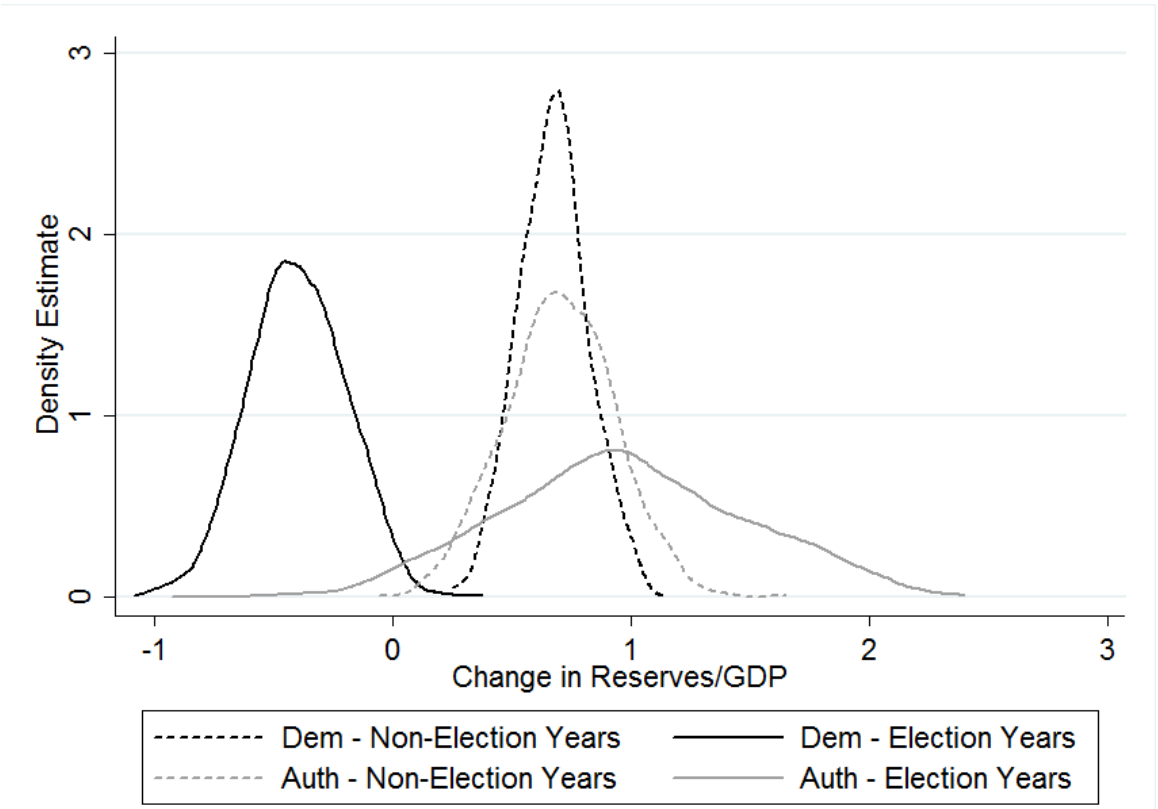


Figure 2.2 plots the density estimates for all four counterfactual scenarios over changes in reserves as a percentage of GDP. The density estimates of democracies and authoritarian regimes for non-election years strongly overlap, indicating that the difference between the two is only minor. The mode for authoritarian elections is slightly to the right but the density estimate is much steeper, which suggests that opposing dynamics in reserve accumulation are at work in some authoritarian regimes during election times. By contrast, changes in reserves drop by about one percent of GDP for democratic elections. As the density estimates are hardly overlapping, it appears to be likely that the effect of democratic elections on reserves is substantial.

The slightly significant coefficient for the number of veto players in models 2-3 turns insignificant in all other model specifications. This casts doubt on the general ability of veto players to influence the level of reserves. Model 1 of Table 2.3, which adds legal central bank independence and the interaction term of formal central bank independence and veto players, shows that legal central bank independence does not seem to affect reserves negatively. Model 2 also shows that the interaction term between formal central

bank independence and Pre-Election is insignificant, suggesting that formal central bank independence does not prevent a political business cycle in reserves depletion.

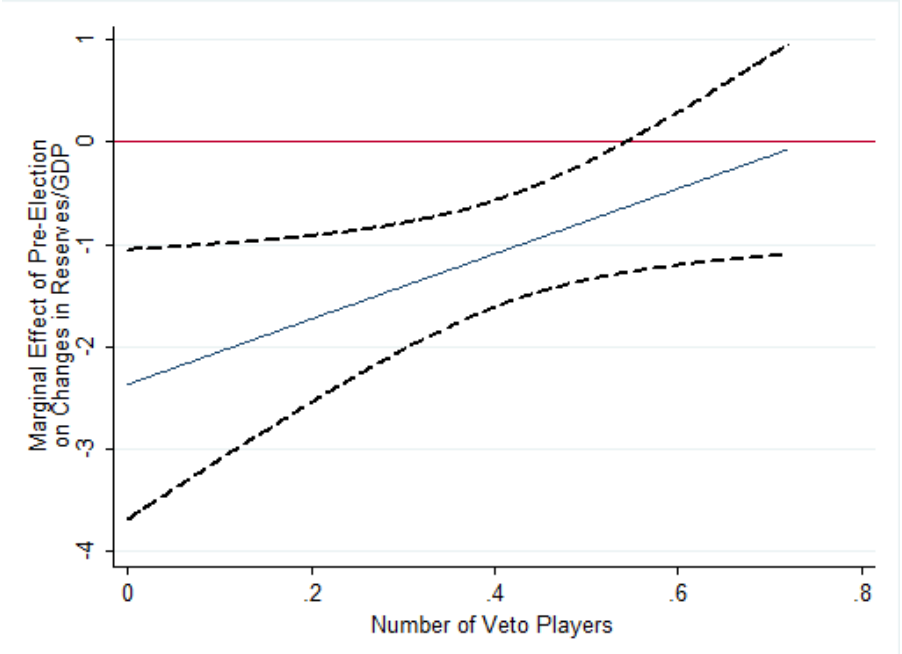
Table 2.3: Testing the interaction terms

	1 Democracy Pol >= 7	2 Democracy Pol >= 7	3 Democracy Pol >= 7	4 Democracy Pol >= 7	5 Auth Pol < 7
CBI x Veto Players t-1	-2.086				
	[0.60]				
Pre-Election x CBI		1.166			
		[1.16]			
Post-Election x CBI		-0.574			
		[0.37]			
Pre-Election x Veto Players t-1			3.185**	3.538*	-0.765
			[2.20]	[1.83]	[0.31]
Post-Election x Veto Players t-1			2.095	2.868	2.304
			[1.07]	[0.87]	[0.84]
Pre-Election	-0.962***	-1.703**	-2.363***	-2.497**	0.422
	[3.14]	[2.38]	[3.61]	[2.54]	[0.48]
Post-Election	-0.714*	-0.368	-1.302	-1.959	-0.921
	[1.87]	[0.36]	[1.45]	[1.16]	[1.09]
Irregular Election	0.620	0.679	1.245**	0.645	-0.860
	[1.15]	[1.24]	[2.64]	[1.19]	[1.35]
Veto Players t-1	1.330	0.101	-2.609*	-1.747	-0.673
	[0.60]	[0.09]	[1.86]	[1.18]	[0.49]
Legal Central Bank Independence	2.875	1.760		1.981*	
	[1.41]	[1.57]		[1.77]	
Irregular Central Bank Turnover	0.198	0.197	0.481	0.276	-0.936
	[0.46]	[0.47]	[0.93]	[0.63]	[0.95]
Euro Membership	-3.211***	-3.247***	-3.852***	-3.277***	
	[2.78]	[2.86]	[3.07]	[2.91]	
Left Government	0.003	0.014	-0.018	-0.004	-0.507
	[0.01]	[0.06]	[0.09]	[0.02]	[0.67]
Banking Crisis	-0.914*	-0.907*	-0.609	-0.902*	-2.742**
	[1.77]	[1.76]	[1.08]	[1.74]	[2.12]
Past Banking Crisis	0.595	0.607*	0.718*	0.614*	-0.358
	[1.64]	[1.69]	[1.94]	[1.72]	[0.55]
Financial Openness	-0.405	-0.409	-0.508**	-0.408	-0.149
	[1.60]	[1.62]	[2.29]	[1.61]	[0.44]
Trade Size	0.024*	0.024*	0.024***	0.024*	0.077***
	[1.71]	[1.69]	[2.93]	[1.68]	[2.66]
Current Account	0.160***	0.159***	0.102***	0.158***	0.071
	[3.47]	[3.50]	[3.38]	[3.55]	[1.07]
Economic Growth	-0.030	-0.031	-0.065**	-0.029	-0.715*
	[0.92]	[0.95]	[2.32]	[0.88]	[1.69]
Fixed Exchange Rate	0.275	0.286	-0.168	0.286	2.252
	[0.78]	[0.82]	[0.42]	[0.82]	[1.64]
Level Reserves/GDP t-1	-0.225***	-0.225***	-0.179***	-0.226***	-0.236***
	[3.64]	[3.68]	[4.23]	[3.66]	[4.85]
Time Dummies	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes
Number of Countries	71	71	92	71	97
Number of Observations	1,144	1,144	1,697	1,144	1,344
R-squared	0.3402	0.3408	0.2583	0.3422	0.4330

Note: * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. Absolute t-values in brackets.

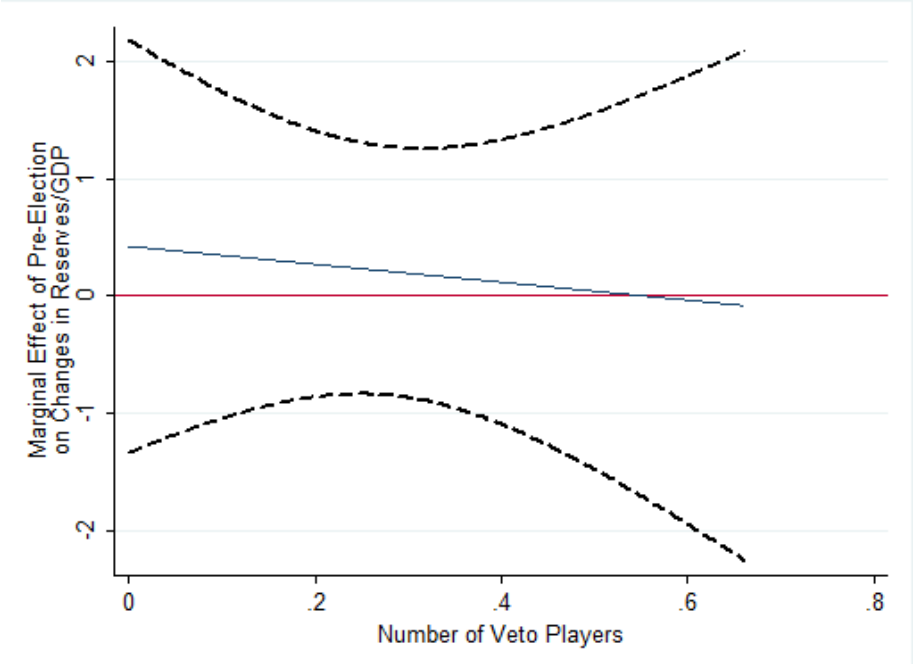
While institutions apparently do not influence reserves directly, it is conceivable that the significant influence of an upcoming election is conditional on the absence of effective veto players as suggested by Hypothesis 2. In order to evaluate Hypothesis 2, models 3-5 of Table 3.3 include the interaction terms between the pre- and post-election dummies and veto players, which are shown by Figures 2.3 and 2.4.

Figure 2.3: Marginal effect of an upcoming election conditional on the number of veto players in *democracies* based on Table 2.3, model 3



Note: The dashed lines give the 95 percent confidence interval.

Figure 2.4: Marginal effect of an upcoming election conditional on the number of veto players in *authoritarian regimes* based on Table 2.3, model 5.



Note: The dashed lines give the 95 percent confidence interval.

Figures 2.3 and 2.4 reveal that there are two different dynamics across regime types: Democracies significantly reduce their reserves-to-GDP ratio before an election if the number of veto players is low but this influence becomes insignificant as the number of veto players increases. This effect is robust to controlling for legal central bank independence. By contrast, the interaction term has no effect in authoritarian regimes, suggesting that checks and balances are not influencing reserves before authoritarian elections.[9]

2.4.3 Robustness tests: Heterogeneity of election cycles

In order to evaluate whether the results are driven by a group of countries, democracies are divided into several subsamples based on exchange rate regime, OECD membership and electoral system (Beck et al. 2001). Authoritarian regimes are divided into two different subsamples based on their degree of competitiveness: Levitsky and Way (2010: 6-7) use the term competitive authoritarianism to define regimes in which "democratic procedures are sufficiently meaningful for opposition groups to take them seriously as arenas through which to contest for power." Within the sample of authoritarian regimes, competitive authoritarianism exists if the ruling party has less than 75 percent of the vote in legislative and executive elections (Beck et al. 2001; Keefer 2011). Table 2.4 shows the results.

The pre-election variable remains negatively significant across all democratic subsamples. Democracies with a fixed or floating exchange rate, OECD members and non-members, and democracies with plurality or PR electoral systems tend to significantly reduce reserves before an election, whereas veto players do not appear to be directly relevant for reserve accumulation. By contrast, the pre-election variable is insignificant for both types of authoritarian regimes in models 7-8. The coefficient for veto players even turns out to be significantly positive in competitive authoritarian regimes, indicating that acquiring reserves tend to become easier if more veto players are present.

While the robustness tests appear to show that the significance of the democratic pre-election dummy is not driven by a particular subsample of countries, it is also necessary to highlight that the empirical evidence obtained by a linear time-series cross-sectional analysis rests on homogeneity assumptions with respect to the reaction of the dependent variable to changes in the explanatory variables. In order to detect model misspecifications, Sims (2010: 66-7) recommends that researchers should analyze whether clustered

[9] Interaction terms based on Pre-Election with an Irregular Central Bank Turnover, or measurements of judiciary independence (based on the World Bank's Worldwide Governance Indicators) turn out to be insignificant for subsamples of democracies and authoritarian regimes. The significance of the Pre-Election variables does not appear to be contingent on inflation.

standard errors depart substantially from conventional standard errors. If a large divergence occurs between the standard errors, researchers should try to fix the problem by respecifying the model (Leamer 2010; King and Roberts 2015).

Table 2.4: Robustness tests – splitting democracies and authoritarian regimes into different subsamples

	Democracies						Authoritarianism	
	Exchange Rate Regime		OECD Member		Electoral System		Competitive Elections	
	Fixed	Float	Yes	No	Plurality	PR	Yes	No
	1	2	3	4	5	6	7	8
Pre-Election	-1.288***	-0.747*	-1.113**	-1.037***	-1.370***	-0.953**	0.431	0.473
	[3.93]	[1.71]	[2.27]	[3.45]	[3.05]	[2.38]	[0.43]	[0.95]
Post-Election	-0.471	-0.611	0.074	-0.726	-0.388	-0.589	-0.950	0.112
	[1.04]	[1.58]	[0.27]	[1.53]	[0.73]	[1.48]	[1.24]	[0.22]
Irregular Election	1.565**	1.129	1.057*	1.565**	2.153***	0.685	-0.616	-1.109
	[2.60]	[1.44]	[1.79]	[2.37]	[3.00]	[1.05]	[0.48]	[1.49]
Veto Players t-1	-1.911	-0.033	-1.866	-1.196	-3.382	0.205	5.271*	-3.721**
	[1.08]	[0.02]	[0.66]	[0.79]	[1.61]	[0.14]	[1.91]	[2.03]
Irregular Central Bank Turnover	0.528	0.260	1.266	0.339	0.175	0.542	-1.065	0.624
	[0.86]	[0.52]	[0.95]	[0.71]	[0.44]	[0.77]	[1.44]	[1.15]
Euro Membership	-3.928**		-2.844***	-10.203**	0.877	-6.018***		
	[2.35]		[3.29]	[2.48]	[1.05]	[4.13]		
Left Government	-0.030	-0.071	-0.255	0.204	-0.150	0.066	0.410	1.689
	[0.10]	[0.27]	[1.26]	[0.54]	[0.54]	[0.25]	[0.24]	[1.23]
Banking Crisis	-0.355	-0.711	0.794*	-1.973**	-2.226**	0.344	-2.650	-0.237
	[0.37]	[1.12]	[1.77]	[2.26]	[2.14]	[0.44]	[1.51]	[0.39]
Past Banking Crisis	0.704	0.970**	1.277**	-0.056	-0.105	1.142**	-0.316	0.075
	[1.37]	[2.09]	[2.48]	[0.14]	[0.27]	[2.37]	[0.27]	[0.13]
Financial Openness	-0.726**	-0.165	-0.312	-0.324	-0.919**	-0.471	0.137	-0.543
	[2.12]	[0.47]	[0.80]	[1.20]	[2.33]	[1.64]	[0.35]	[1.43]
Trade Size	0.019*	0.046**	0.029	0.020	0.010	0.027**	0.062**	0.043**
	[1.81]	[2.34]	[1.51]	[1.66]	[0.60]	[2.43]	[2.11]	[2.56]
Current Account	0.112***	0.112**	-0.009	0.127***	0.152***	0.044	0.128**	0.099**
	[3.22]	[2.09]	[0.21]	[3.52]	[3.28]	[1.02]	[2.18]	[1.99]
Economic Growth	-0.113**	-0.017	-0.070	-0.065**	-0.132***	-0.037	-0.902***	-0.062
	[2.28]	[0.36]	[0.94]	[2.05]	[3.09]	[0.91]	[2.91]	[1.56]
Fixed Exchange Rate			0.766	-0.534	-0.332	0.074	2.485**	-0.619
			[0.75]	[1.46]	[0.73]	[0.12]	[2.00]	[0.91]
Level Reserves/GDP t-1	-0.190***	-0.258***	-0.143*	-0.215***	-0.151***	-0.244***	-0.598***	-0.150***
	[3.39]	[5.08]	[2.01]	[2.96]	[4.88]	[4.07]	[8.21]	[2.71]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	77	53	34	65	40	55	66	67
Number of Observations	1,074	623	662	1,028	641	978	589	755
R-squared	0.2816	0.3482	0.2386	0.3351	0.3244	0.2995	0.7374	0.3322

Note: * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. Absolute t-values in brackets.

In the case of the democratic pre-election variable, the difference between clustered and conventional standard is moderate across all models, except for Model 2 (0.228 to 0.436) and Model 3 (0.277 to 0.429) of Table 2.2. While most values of the dependent variable are distributed around its mean, some extreme outliers exist that drive the heteroskedastity of the dependent variable when it is predicted by the pre-election variable. Removing the smallest and largest percentiles of the dependent variable and re-analyzing the models yields a modest difference between both standard errors for Model 2 (0.197

to 0.239) and Model 3 (0.196 to 0.240) of Table 2.2, while both coefficients remain negative and significant at the 90 percent confidence level in Model 2 (-0.333, t-value -1.69) and at the 99 percent from non-democracies in Model 3 (-0.631, t-value -3.21).[10]

2.5 Conclusion

As several economists have blamed the rapid accumulation of reserves by developing countries for persistent global imbalances, a growing number of empirical studies evaluates how macroeconomic factors could explain the recent surge in reserves hoarding. The previous studies argue that reserve accumulation is either a self-insurance strategy against financial turmoil, or that it is a mercantilist strategy to stimulate export-led growth.

This study extends the previous work by showing that the ability for governments to invest in foreign reserves is not independent of the constraints of the political environment. Foreign reserves can be used in the short run for an expansionary monetary policy without negatively affecting the exchange rate, to defend the national currency against depreciation pressures, or for clientelistic policies. Such measures are more likely before an election, because they improve the incumbent's chances of re-election. The empirical section appears to confirm the negative association between an upcoming democratic election and reserves.

Democratic veto players appear to limit pre-election manipulation attempts, but they do not influence reserves directly. The measurements for legal central bank independence and irregular central bank governor turnover also do not seem to influence reserves directly, indicating that formal central bank independence might not matter for changes in reserves over an election cycle. A possible explanation is that central banks generally tend to pursue macroeconomic stability before an election, and are willing to deplete reserves to reach that goal. This would confirm the findings by Grier (1987) and Dreher and Vaubel (2009), which show that even independent central banks do engage in expansionary monetary policy before an election. Political veto players, by contrast, have an interest

[10] The democratic pre-election variable remains significant in all other model specifications except for the subsample of democracies with a floating exchange rate of Table 2.4, Model 2. However, the difference between both standard errors of the pre-election variable in the original model is minuscule (0.436 to 0.443), while it becomes larger (0.289 to 0.359) when the outliers are removed. The democratic pre-election variable is significant for a logarithmic transformation of the dependent variable across all model specifications.

in a turnover in power, and might be more willing to use their veto power to block expansionist policies before an upcoming election.

This study also contributes to the burgeoning literature on authoritarian institutions. Elections and institutional checks and balances have a different meaning in democratic and authoritarian regimes. Democratic incumbents require the consent of veto players to enact policies, and they only stay in office if they get re-elected. By contrast, authoritarian rulers can close down recalcitrant assemblies, and they cannot lose authoritarian elections.

As authoritarian survival is empirically associated with elections and assemblies, it is conceivable that these nominally democratic institutions in non-democratic settings might resemble the functioning of their democratic counterparts. Under such circumstances, the political business cycle and veto player theories should fail to explain why authoritarian regimes were able to increase their reserves vis-à-vis democracies.

But the empirical analysis suggests that authoritarian rulers are not likely to manipulate reserves before elections, and veto players in such regimes appear to have no negative effect on reserves. These results imply that the signal strength and cooptation theories are not dominant strategies for authoritarian regimes – at least not in the case of foreign reserves.

In addition to the introduction of the euro, an upcoming election seems to explain why democracies have acquired less foreign reserves than authoritarian regimes, since investing in foreign reserves has become a salient issue in international political economy.

References

Adolph, Christoper. 2013. *Bankers, bureaucrats, and central bank politics: the myth of neutrality.* Cambridge: Cambridge University Press.

Aidt, Toke S., Zareh Asatryan, Lusine Badalyan, and Friedrich Heinemann. 2015. "Vote buying or (political) business (cycles) as usual?." ZEW Discussion Paper No. 15-017.

Aizenman, Joshua, Yin-Wong Cheung, and Hiro Ito. 2015. "International reserves before and after the global crisis: Is there no end to hoarding?." *Journal of International Money and Finance* 52: 102-126.

Aizenman, Joshua, Menzie D. Chinn, and Hiro Ito. 2013. "The "impossible trinity" hypothesis in an era of global imbalances: measurement and testing." *Review of International Economics* 21(3): 447-458.

Aizenman, Joshua, and Jaewoo Lee. 2007. "International reserves: precautionary versus mercantilist views, theory and evidence." *Open Economies Review* 18(2): 191-214.

Aizenman, Joshua, and Jaewoo Lee. 2008. "Financial versus Monetary Mercantilism: Long-run View of Large International Reserves Hoarding." *World Economy* 31(5): 593-611.

Allen, Franklin, and Joo Yun Hong. 2011. "Why are there large foreign exchange reserves? The case of South Korea." *Korean Social Science Journal* 38(2): 1-33.

Alt, James E., and David D. Lassen. 2006. "Transparency, political polarization, and political budget cycles in OECD countries." *American Journal of Political Science* 50(3): 530-550.

Andrews, Josephine T., and Gabriella R. Montinola. 2004. "Veto players and the rule of law in emerging democracies." *Comparative Political Studies* 37(1): 55-87.

Arnone, Marco, Bernard Laurens, Jean-François Segalotto, and Martin Sommer. 2007. "Central bank autonomy: lessons from global trends." IMF Working Papers WP/07/88.

Baskaran, Thushyanthan, Adi Brender, Sebastian Blesse, and Yaniv Reingewertz. 2016. "Revenue decentralization, central oversight and the political budget cycle: Evidence from Israel." *European Journal of Political Economy* 42: 1-16.

Bastourre, Diego, Jorge Carrera, and Javier Ibarlucia. 2009. "What is driving reserve accumulation? A dynamic panel data approach." *Review of International Economics* 17(4): 861-877.

Bearce, David H., and Mark Hallerberg. 2011. "Democracy and de facto exchange rate regimes." *Economics & Politics* 23(2): 172-194.

Beck, Thorsten, George Clarke, Alberto Groff, Philip Keefer, and Patrick Walsh. 2001. "New tools in comparative political economy: The Database of Political Institutions." *World Bank Economic Review* 15(1): 165-176.

Belke, Ansgar, and Niklas Potrafke. 2012. "Does government ideology matter in monetary policy? A panel data analysis for OECD countries." *Journal of International Money and Finance* 31(5): 1126-1139.

Bernanke, Ben S. 2005. "The Global Savings Glut and the U.S. Current Account Deficit." Sandridge Lecture, Virginia Association of Economics, Richmond, Virginia, March 10.

Bernhard, William, and David Leblang. 2006. *Democratic processes and financial markets: Pricing politics*. Cambridge: Cambridge University Press.

Blanchard, Olivier J., and Gian Maria Milesi-Ferretti. 2010. "Global imbalances: In midstream?." CEPR Discussion Paper 7693.

Blaydes, Lisa. 2010) *Elections and distributive politics in Mubarak's Egypt*. Cambridge: Cambridge University Press.

Bodea, Cristina, and Raymond Hicks. 2015. "Price stability and central bank independence: Discipline, credibility, and democratic institutions." *International Organization* 69(1): 35-61.

Boix, Carles, and Milan W. Svolik. 2013. "The foundations of limited authoritarian government: Institutions, commitment, and power-sharing in dictatorships." *Journal of Politics* 75(2): 300-316.

Broz, J. Lawrence. 2002. "Political system transparency and monetary commitment regimes." *International Organization* 56(4): 861-887.

Bussière, Matthieu, Gong Cheng, Menzie D. Chinn, and Noëmie Lisack. 2015. "For a few dollars more: Reserves and growth in times of crises." *Journal of International Money and Finance* 52(2): 127–145.

Canes-Wrone, Brandice, and Jee-Kwang Park. 2012. "Electoral business cycles in OECD countries." *American Political Science Review* 106(1): 103-122.

Cheibub, José Antonio, Jennifer Gandhi, and James R. Vreeland. 2010. "Democracy and dictatorship revisited." *Public Choice* 143(1-2): 67-101.

Cheung, Yin-Wong, and Xingwang Qian. 2009. "Hoarding of international reserves: Mrs Machlup's wardrobe and the Joneses." *Review of International Economics* 17(4): 824-843.

Chinn, Menzie D., and Hiro Ito. 2008. "A new measure of financial openness." *Journal of Comparative Policy Analysis* 10(3): 309-322.

Chung, Hee Chun. 2010. "The Bank of Korea's policy response to the global financial crisis." *BIS Papers* 54: 257-266.

Clark, William R., Usha N. Reichert, Sandra L. Lomas, and Kevin L. Parker. 1998. "International and domestic constraints on political business cycles in OECD economies." *International Organization 52*(1): 87-120.

Cook, David E., and James Yetman. 2012. "Expanding central bank balance sheets in emerging Asia: a compendium of risks and some evidence." *BIS Paper* 66d: 30-75.

Corden, W. Max. 2009. "China's exchange rate policy, its current account surplus and the global imbalances." *The Economic Journal 119*(541): F430-F441.

Cox, Gary W., and Mathew D. McCubbins. 2001. "The Institutional Determinants of Economic Policy Outcomes." Pp. 27-89 in: Stephan Haggard and Matthew D. McCubbins (eds.): *Presidents, Parliaments, and Policy*. Cambridge: Cambridge University Press.

Crowe, Christopher. 2008. "Goal independent central banks: Why politicians decide to delegate." *European Journal of Political Economy* 24(4): 748-762.

Crowe, Christopher, and Ellen E. Meade. 2008. "Central bank independence and transparency: Evolution and effectiveness." *European Journal of Political Economy* 24(4): 763-777.

Debelle, Guy, and Stanley Fischer. 1994. "How Independent Should a Central Bank Be?." Pp. 195-221 in: Jeffrey C. Fuhrer (ed.): *Goals, Guidelines and Constraints Facing Monetary Policymakers.* Boston: Federal Reserve Bank of Boston.

De Haan, Jakob, and Jeroen Klomp. 2013. "Conditional political budget cycles: a review of recent evidence." *Public Choice* 157(3-4): 387-410.

Delatte, Anne-Laure, and Julien Fouquau. 2012. "What Drove the Massive Hoarding of International Reserves in Emerging Economies? A Time-varying Approach." *Review of International Economics* 20(1): 164-176.

Dooley, Michael P., David Folkerts-Landau, and Peter Garber. 2004. "The revived bretton woods system." *International Journal of Finance & Economics* 9(4): 307-313.

Dreher, Axel, and Roland Vaubel. 2009. "Foreign exchange intervention and the political business cycle: A panel data analysis." *Journal of International Money and Finance* 28(5): 755-775.

Dreher, Axel, Jan-Egbert Sturm, and Jakob De Haan. 2008. "Does high inflation cause central bankers to lose their job? Evidence based on a new data set." *European Journal of Political Economy* 24(4): 778-787.

Dreher, Axel, Jan-Egbert Sturm, and Jakob De Haan. 2010. "When is a central bank governor replaced? Evidence based on a new data set." *Journal of Macroeconomics* 32(3): 766-781.

Feldstein, Martin. 1999. "A Self-Help Guide for Emerging Markets." *Foreign Affairs* 78(2): 93-109.

Franzese, Robert J. 2002. "Electoral and partisan cycles in economic policies and outcomes." *Annual Review of Political Science* 5: 369-421.

Frieden, Jeffry A. 1991. "Invested interests: the politics of national economic policies in a world of global finance." *International Organization* 45(4): 425-451.

Gandhi, Jennifer. 2008. *Political institutions under dictatorship*. Cambridge: Cambridge University Press.

Gandhi, Jennifer, and Ellen Lust-Okar. 2009. "Elections under authoritarianism." *Annual Review of Political Science* 12: 403-422.

Gandhi, Jennifer, and Adam Przeworski. 2006. "Cooperation, cooptation, and rebellion under dictatorships." *Economics & Politics* 18(1): 1-26.

Gandhi, Jennifer, and Adam Przeworski. 2007. "Authoritarian institutions and the survival of autocrats." *Comparative Political Studies* 40(11): 1279-1301.

Geddes, Barbara. 1999. "What do we know about democratization after twenty years?." *Annual Review of Political Science* 2: 115-144.

Geddes, Barbara. 2008. "Party Creation as an Autocratic Survival Strategy." Unpublished Manuscript.

Gehlbach, Scott, and Philip Keefer. 2011. "Investment without democracy: Ruling-party institutionalization and credible commitment in autocracies." *Journal of Comparative Economics* 39(2): 123-139.

Gourinchas, Pierre-Olivier, Rodrigo Valdes, and Oscar Landerretche. 2001. "Lending Booms: Latin America and the World." NBER Working Paper 8249.

Greenspan, Alan. 1999. "Currency Markets and Debt." World Bank Conference on Recent Trends in Reserve Management, Washington, D.C., 29 April.

Grier, Kevin B. 1987. "Presidential elections and Federal Reserve policy: An empirical test." *Southern Economic Journal* 454(2): 475-486.

Hadenius, Axel, and Jan Teorell. 2007. "Pathways from authoritarianism." *Journal of Democracy* 18(1): 143-157.

Hansen, Jørgen D., Roswitha M. King, and Virmantas Kvedaras. 2011. "The international reserves issue in the EMU." *Open Economies Review* 22(1): 143-161.

Hayo, Bernd, and Carsten Hefeker. 2002. "Reconsidering central bank independence." *European Journal of Political Economy* 18(4): 653-674.

Hayo, Bernd, and Stefan Voigt. 2008. "Inflation, central bank independence, and the legal system." *Journal of Institutional and Theoretical Economics* 164(4): 751-777.

Heller, Heinz R. 1966. "Optimal international reserves." *The Economic Journal* 76(302): 296-311.

Henisz, Witold J. 2000. "The institutional environment for economic growth." *Economics & Politics* 12(1): 1-31.

Hielscher, Kai, and Gunther Markwardt. 2012. "The role of political institutions for the effectiveness of central bank independence." *European Journal of Political Economy* 28(3): 286-301.

Hyde, Susan D., and Nikolay Marinov. 2011. "Which elections can be lost?." *Political Analysis 20*(2): 191-2010.

Ilzetzki, Ethan, Carmen Reinhart, and Kenneth Rogoff. 2008. "Exchange rate arrangements entering the 21st century: Which anchor will hold?." http://personal.lse.ac.uk/ilzetzki/IRRBack.htm.

Jeanne, Olivier. 2007. "International reserves in emerging market countries: too much of a good thing?." *Brookings Papers on Economic Activity* 8(1): 1-55.

Jensen, Nathan M., Edmund Malesky, and Stephen Weymouth. 2014. "Unbundling the relationship between authoritarian legislatures and political risk." *British Journal of Political Science* 44(3): 655-684.

Jones, Erik. 2009. "Shifting the Focus: The New Political Economy of Global Macroeconomic Imbalances." *SAIS Review of International Affairs* 29(2): 61-73.

Judson, Ruth A., and Ann L. Owen. 1999. "Estimating dynamic panel data models: a guide for macroeconomists." *Economics Letters* 65(1): 9-15.

Julio, Brandon, and Youngsuk Yook. 2012. "Political uncertainty and corporate investment cycles." *Journal of Finance* 67(1): 45-83.

Keech, William R. 1995. *Economic politics: The costs of democracy*. Cambridge: Cambridge University Press.

Keefer, Philip. 2011. "Collective action, political parties, and pro-development public policy." *Asian Development Review* 28(1): 94-118.

Keefer, Philip, and David Stasavage. 2003. "The limits of delegation: Veto players, central bank independence, and the credibility of monetary policy." *American Political Science Review* 97(3): 407-423.

Kelly, Michael G. 1970. "The demand for international reserves." *American Economic Review* 60(4): 655-667.

King, Gary, and Margaret E. Roberts. 2015. "How robust standard errors expose methodological problems they do not fix, and what to do about it." *Political Analysis* 23(2): 159-179.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the most of statistical analyses: Improving interpretation and presentation." *American Journal of Political Science* 44(2): 347-361.

Kitschelt, Herbert. 2000. "Linkages between citizens and politicians in democratic polities." *Comparative Political Studies* 33(6-7): 845-879.

Klein, Brain P., and Kenneth N. Cukier. 2009. "Tamed Tigers, Distressed Dragon: How Export-Led Growth Derailed Asia's Economies." *Foreign Affairs* 88(4): 7-16.

Klomp, Jeroen, and Jakob De Haan. 2010. "Inflation and Central Bank Independence: A Meta-Regression Analysis." *Journal of Economic Surveys* 24(4): 593-621.

Kumhof, Michael. 2004. "Sterilization of short-term capital inflows—through lower interest rates?." *Journal of International Money and Finance* 23(7): 1209-1221.

Laeven, Luc, and Fabian Valencia. 2008. "Systemic Banking Crises: A New Database." IMF Working Paper WP/08/224.

Laeven, Luc, and Fabian Valencia. 2012. "Systemic Banking Crises Database: An Update." IMF Working Paper WP/12/163.

Lane, Philip R., and Dominic Burke. 2001. "The empirics of foreign reserves." *Open Economies Review* 12(4): 423-434.

Leamer, Edward E. 2010. "Tantalus on the Road to Asymptopia." *Journal of Economic Perspectives* 24(2): 31-46.

Levitsky, Steven, and Lucan A. Way. 2010. *Competitive Authoritarianism: Hybrid Regimes after the Cold War.* Cambridge: Cambridge University Press.

Lohmann, Susanne. 1998. "Federalism and central bank independence: the politics of German monetary policy, 1957–92." *World Politics* 50(3): 401-446.

Lust-Okar, Ellen. 2006. "Elections under authoritarianism: Preliminary lessons from Jordan." *Democratization* 13(3): 456-471.

MacIntyre, Andrew. 2001. "Institutions and investors: The politics of the economic crisis in Southeast Asia." *International Organization* 55(1): 81-122.

Magaloni, Beatriz. 2006. *Voting for autocracy: Hegemonic party survival and its demise in Mexico*. Cambridge: Cambridge University Press.

Maier, Philipp F., and Jakob De Haan. 2000. "How Independent is the Bundesbank Really?." Pp. 6-42 in: Jakob De Haan (ed.); *The History of the Bundesbank: Lessons for the European Central Bank*. London: Routledge.

Malesky, Edmund, and Paul Schuler. 2010. "Nodding or needling: Analyzing delegate responsiveness in an authoritarian parliament." *American Political Science Review* 104(3): 482-502.

Marinov, Nikolay, William G. Nomikos, and Josh Robbins. 2015. "Does Electoral Proximity Affect Security Policy?." *Journal of Politics* 77(3): 762-773.

Marshall, Monty G., and Keith Jaggers. 2014. "Polity IV project: Political regime characteristics and transitions, 1800-2013." College Park: University of Maryland.

Maxfield, Sylvia. 1998. *Gatekeepers of growth: the international political economy of central banking in developing countries*. Princeton: Princeton University Press.

Mendoza, Ronald U. 2010. "Was the Asian crisis a wake-up call?: Foreign reserves as self-protection." *Journal of Asian Economics* 21(1): 1-19.

Mohanty, Madhusudan S., and Philip Turner. 2006. "Foreign exchange reserve accumulation in emerging markets: what are the domestic implications?." *BIS Quarterly Review* 11(3): 39-52.

Nakamichi, Takashi. 2013. "Japan Looks to Hire Managers for Foreign-Exchange Reserves." *The Wall Street Journal*, October 14.

Nickell, Stephen. 1981. "Biases in dynamic models with fixed effects." *Econometrica* 49(6): 1417-1426.

Nordhaus, William D. 1975. "The political business cycle." *Review of Economic Studies* 42(2): 169-190.

North, Douglass C., and Barry R. Weingast. 1989. "Constitutions and commitment: the evolution of institutions governing public choice in seventeenth-century England." *Journal of Economic History* 49(4): 803-832.

Obstfeld, Maurice, Jay C. Shambaugh, and Alan M. Taylor. 2010. "Financial stability, the trilemma, and international reserves." *American Economic Journal: Macroeconomics* 2(2): 57-94.

Pepinsky, Thomas. 2007. "Autocracy, elections, and fiscal policy: evidence from Malaysia." *Studies in Comparative International Development* 42(1-2): 136-163.

Pineau, Georges, Ettore Dorrucci, Fabio Comelli, and Angelika Lagerblom. 2006. "The accumulation of foreign reserves." ECB Occasional Paper 43.

Plümper, Thomas, and Eric Neumayer. 2011. "Fear of Floating and de Facto Exchange Rate Pegs with Multiple Key Currencies." *International Studies Quarterly* 55(4): 1121-1142.

Plümper, Thomas, Vera E. Troeger, and Philip Manow. 2005. "Panel data analysis in comparative politics: Linking method to theory." *European Journal of Political Research* 44(2): 327-354.

Posen, Adam S. 1995. "Declarations are not enough: financial sector sources of central bank independence." *NBER Macroeconomics Annual* 10: 253-274.

Potrafke, Niklas. 2010. "The growth of public health expenditures in OECD countries: do government ideology and electoral motives matter?." *Journal of Health Economics* 29(6): 797-810.

Przeworski, Adam. 1991. *Democracy and the market: Political and economic reforms in Eastern Europe and Latin America*. Cambridge: Cambridge University Press.

Reinhart, Carmen M., Vincent Reinhart, and Takeshi Tashiro. 2016. "Does reserve accumulation crowd out investment?." *Journal of International Money and Finance* 63: 89-111.

Reischmann, Markus. 2016. Creative accounting and electoral motives: Evidence from OECD countries. *Journal of Comparative Economics* 44(2): 243-257.

Rodrik, Dani. 1991. "Policy uncertainty and private investment in developing countries." *Journal of Development Economics* 36(2): 229-242.

Rodrik, Dani. 2006. "The social cost of foreign exchange reserves." *International Economic Journal* 20(3): 253-266.

Sachs, Jeffrey D. 1989. "Social conflict and populist policies in Latin America." NBER Working Paper No. 2897.

Santiso, Javier. 2014. *Banking on Democracy*. Cambridge: MIT Press.

Schedler, Andreas. 2002. The nested game of democratization by elections. *International Political Science Review* 23(1): 103-122.

Schrøder, Søren, and Esben Humble Slotsbjerg. 2008. "Foreign-Exchange Reserves and Sovereign Wealth Funds." *Danmarks Nationalbank Monetary Review 2nd Quarter*.

Shih, Victor, and David A. Steinberg. 2012. "The Domestic Politics of the International Dollar Standard: A Statistical Analysis of Support for the Reserve Currency, 2000–2008." *Canadian Journal of Political Science* 45(4): 855-880.

Sims, Christopher A. 2010. "But economics is not an experimental science." *Journal of Economic Perspectives* 24(2): 59-68.

Summers, Lawrence. H. 2006. "Reflections on Global Account Imbalances and Emerging Markets Reserve Accumulation." L. K. Jha Memorial Lecture, Reserve Bank of India, Mumbai, March 24.

Steinberg, David A., and Krishan Malhotra. 2014. "The Effect of Authorita rian Regime Type on Exchange Rate Policy." *World Politics* 66(3): 491-529.

Steinberg, David A., and Victor C. Shih. 2012. "Interest Group Influence in Authoritarian States The Political Determinants of Chinese Exchange Rate Policy." *Comparative Political Studies* 45(11): 1405-1434.

Tan, Kevin. 1999. "A Short Legal and Constitutional History of Singapore." Pp. 26-66 in: Kevin Tan (ed.): *The Singapore Legal System*. Singapore: Singapore University Press.

Tepe, Markus, and Pieter Vanhuysse. 2014. "A vote at the opera? The political economy of public theaters and orchestras in the German states." *European Journal of Political Economy* 36: 254-273.

Tomz, Michael, Jason Wittenberg, and Gary King. 2003. "CLARIFY: Software for interpreting and presenting statistical results." *Journal of Statistical Software* 8(1): 1-30.

Tsebelis, George. 1995. "Decision making in political systems: Veto players in presidentialism, parliamentarism, multicameralism and multipartyism." *British Journal of Political Science* 25(3): 289-325.

Tufte, Edward R. 1978. *Political Control of the Economy.* Princeton: Princeton University Press.

Valença, Márcio M. 1999. "Patron-client relations and politics in Brazil." *Research Papers in Environmental and Spatial Analysis* 58: 1-42.

Vaubel, Roland. 1997a. "The bureaucratic and partisan behavior of independent central banks: German and international evidence." *European Journal of Political Economy* 13(2): 201-224.

Vaubel, Roland. 1997b. "Reply to Berger and Woitek." *European Journal of Political Economy* 13(4): 823-827.

Walter, Stefanie. 2009. "The limits and rewards of political opportunism: How electoral timing affects the outcome of currency crises." *European Journal of Political Research* 48(3): 367-396.

Walter, Stefanie, and Thomas D. Willett. 2012. "Delaying the inevitable: A political economy approach to currency defenses and depreciation." *Review of International Political Economy* 19(1): 114-139.

Wolf, Martin. 2008. *Fixing Global Finance*. Baltimore: Johns Hopkins University Press.

Wright, Joseph. 2008. "Do authoritarian institutions constrain? How legislatures affect economic growth and investment." *American Journal of Political Science* 52(2): 322-343.

Appendix: Additional tables

Table 2.5: Descriptive statistics

	Obs	Min	Max	Mean	Std. dev.
Δ Reserves/GDP (whole sample)	4041	-166.38	176.61	0.49	6.04
Δ Reserves/GDP (democracies)	2012	-46.51	32.29	0.31	3.99
Δ Reserves/GDP (authoritarian)	2029	-166.38	176.61	0.67	7.54
Reserves/GDP t-1	4055	0.01	318.56	16.54	17.94
Democracy	4589	0	1	0.49	0.50
Polity-IV score	4589	-10	10	3.55	6.57
Democracy (DD definition)	3561	0	1	0.56	0.50
Pre-Election	4589	0	1	0.26	0.33
Post-Election	4589	0	0.99	0.22	0.31
Pre-Democratic Election	4589	0	1	0.13	0.27
Post-Democratic Election	4589	0	0.99	0.12	0.25
Pre-Authoritarian Election	4589	0	1	0.12	0.27
Post-Authoritarian Election	4589	0	0.99	0.10	0.24
Irregular Election	4589	0	1	0.08	0.23
Veto Players t-1	4359	0	0.72	0.26	0.21
Democratic Veto Players t-1	4359	0	0.72	0.19	0.22
Authoritarian Veto Players t-1	4359	0	0.67	0.08	0.16
Legal Central Bank Independence	1628	0.16	0.96	0.59	0.22
Irregular Central Bank Turnover	4042	0	1	0.12	0.32
Euro Membership	4589	0	1	0.04	0.21
Left Government	4589	0	1	0.25	0.44
Banking Crisis	4081	0	1	0.03	0.16
Past Banking Crisis	4081	0	1	0.20	0.40
Financial Openness	4082	-1.89	2.39	0.26	1.58
Trade Size	4206	0.31	531.74	86.24	51.88
Current Account	3738	-240.50	291.32	-2.99	14.33
Economic Growth	4398	-64.05	149.97	3.71	7.03
Fixed Exchange Rate	4165	0	1	0.69	0.46

Table 2.6: OLS regression analysis to explain changes of foreign reserves as a percentage of GDP based on different measurements and subsamples for democracies and authoritarian regimes

	1 Whole Sample Democracy Pol >= 6	2 Whole Sample Democracy Pol >= 8	3 Subsample Democracy Pol >= 6	4 Subsample Democracy Pol >= 8	5 Subsample Full Auth. Pol <=0	6 Subsample Part Auth 0 >Pol< 7	7 Whole Sample (DD)	8 Subsample Democracy (DD)	9 Subsample Auth. (DD)
Democracy	0.838	0.683					0.701		
	[1.09]	[0.79]					[1.30]		
Pre-Democratic Election	-0.697***	-0.712**	-0.901***	-1.012***			-0.504**	-0.453**	
	[2.73]	[2.56]	[3.78]	[3.72]			[2.35]	[2.38]	
Post-Democratic Election	-0.475	-0.381	-0.434	-0.410			-0.418	-0.430	
	[1.61]	[1.20]	[1.52]	[1.26]			[1.47]	[1.54]	
Pre-Authoritarian Election	-0.164	-0.310			0.422	-0.197	-0.007		-0.127
	[0.30]	[0.78]			[0.60]	[0.33]	[0.02]		[0.25]
Post-Authoritarian Election	-0.435	-0.528			-0.546	-0.207	-0.193		-0.324
	[0.79]	[1.14]			[0.61]	[0.39]	[0.41]		[0.71]
Irregular Election	0.122	0.140	1.034**	1.093**	-0.975	-0.178	0.272	0.287	0.177
	[0.31]	[0.36]	[2.42]	[2.18]	[0.95]	[0.23]	[0.75]	[0.70]	[0.24]
Democratic Veto Players t-1	-1.519	-1.622	-0.983	-1.232			-0.881	-0.488	
	[1.39]	[1.21]	[1.00]	[0.93]			[1.35]	[0.69]	
Authoritarian Veto Players t-1	-0.614	-0.606			-4.245**	1.475	-1.553		-2.000
	[0.44]	[0.56]			[2.27]	[1.23]	[1.03]		[1.04]
Irregular Central Bank Turnover	-0.227	-0.218	0.222	0.581	-1.729	-0.448	0.242	-0.069	0.786
	[0.41]	[0.39]	[0.54]	[0.98]	[0.98]	[0.97]	[1.03]	[0.25]	[1.61]
Euro Membership	-5.482***	-5.493***	-3.899***	-4.202***			-3.559***	-4.218***	
	[3.71]	[3.71]	[3.25]	[3.37]			[3.17]	[3.34]	
Left Government	0.164	0.157	0.029	0.001	-0.896	-0.809	0.286	0.281	0.976
	[0.67]	[0.63]	[0.16]	[0.00]	[0.58]	[1.53]	[1.52]	[1.40]	[0.91]
Banking Crisis	-1.950**	-1.962**	-0.642	-0.549	-2.363	-2.162*	-1.000**	-0.682	-2.465***
	[2.19]	[2.18]	[1.19]	[0.83]	[1.47]	[1.72]	[2.18]	[1.34]	[2.90]
Past Banking Crisis	0.107	0.107	0.684**	0.860**	-0.708	0.341	0.361	0.507*	0.093
	[0.24]	[0.24]	[2.00]	[2.20]	[0.80]	[0.47]	[1.45]	[1.77]	[0.19]
Financial Openness	-0.418**	-0.435**	-0.475**	-0.506**	-0.651	0.128	-0.438***	-0.406**	-0.531*
	[2.17]	[2.24]	[2.32]	[2.35]	[1.24]	[0.32]	[2.84]	[2.09]	[1.70]
Trade Size	0.054***	0.054***	0.025***	0.022**	0.098**	0.048***	0.035***	0.028***	0.045**
	[3.00]	[2.98]	[3.23]	[2.61]	[2.56]	[3.03]	[3.93]	[3.55]	[2.45]
Current Account	0.053	0.053	0.109***	0.098***	0.018	0.149***	0.106***	0.125***	0.110**
	[0.98]	[0.98]	[3.78]	[3.05]	[0.17]	[3.58]	[3.32]	[4.01]	[2.12]
Economic Growth	-0.528	-0.527	-0.055**	-0.086**	-0.926*	-0.054	-0.054**	-0.047	-0.051
	[1.51]	[1.51]	[2.14]	[2.78]	[1.96]	[0.91]	[2.33]	[1.59]	[1.45]
Fixed Exchange Rate	0.745	0.759	-0.314	-0.203	3.038*	-0.090	0.551*	0.060	1.559***
	[1.10]	[1.12]	[0.88]	[0.43]	[1.68]	[0.14]	[1.95]	[0.16]	[2.86]
Level Reserves/GDP t-1	-0.223***	-0.223***	-0.187***	-0.186***	-0.210***	-0.301***	-0.213***	-0.285***	-0.185***
	[5.93]	[5.93]	[4.81]	[4.21]	[3.12]	[9.55]	[5.60]	[7.19]	[4.01]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	154	154	104	83	69	64	153	101	77
Number of Observations	3,041	3,041	1,916	1,504	761	583	2,394	1,540	854
R-squared	0.3385	0.3384	0.2592	0.2694	0.5236	0.4307	0.2689	0.2969	0.3017

Note: * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. Absolute t-values in brackets.

Table 2.7: GLS Prais-Winsten regression analysis to explain changes of foreign reserves as a percentage of GDP

	1 Whole Sample Pol >= 7	2 Subsample Democracy Pol >= 7	3 Subsample Democracy Pol >= 7	4 Whole Sample Democracy Pol >= 6	5 Whole Sample Dem Pol >= 8	6 Whole Sample (DD)
CBI x Veto Players t-1			-4.604			
			[1.24]			
Democracy	1.084			1.159	1.357	0.992
	[1.25]			[1.41]	[1.48]	[1.35]
Pre-Democratic Election	-0.548**	-0.653***	-0.514**	-0.542**	-0.511**	-0.330*
	[2.29]	[3.33]	[2.60]	[2.34]	[2.04]	[1.83]
Post-Democratic Election	-0.394*	-0.482**	-0.463*	-0.458**	-0.349*	-0.381**
	[1.96]	[2.63]	[1.93]	[2.46]	[1.70]	[2.07]
Pre-Authoritarian Election	-0.136			-0.070	-0.246	0.168
	[0.39]			[0.17]	[0.86]	[0.45]
Post-Authoritarian Election	-0.354			-0.243	-0.441	0.005
	[0.92]			[0.57]	[1.26]	[0.01]
Irregular Election	0.441	0.786**	0.326	0.441	0.442	0.173
	[0.97]	[2.25]	[1.04]	[1.00]	[0.97]	[0.52]
Democratic Veto Players t-1	-1.125	0.060	3.975*	-0.414	-0.700	0.445
	[0.96]	[0.06]	[1.93]	[0.47]	[0.62]	[0.50]
Authoritarian Veto Players t-1	1.226			0.972	0.689	-1.171
	[0.76]			[0.45]	[0.46]	[0.72]
Legal Central Bank Independence			3.578			
			[1.65]			
Irregular Central Bank Turnover	-0.233	0.105	-0.092	-0.242	-0.237	0.068
	[0.79]	[0.35]	[0.39]	[0.82]	[0.80]	[0.36]
Euro Membership	-13.07***	-11.74***	-7.635***	-13.04***	-13.06***	-10.57***
	[4.67]	[4.05]	[4.32]	[4.66]	[4.67]	[3.46]
Left Government	0.428	0.263	0.239	0.424	0.405	0.642**
	[1.39]	[1.43]	[1.06]	[1.37]	[1.33]	[2.30]
Banking Crisis	-0.928*	-0.769	-1.035**	-0.917*	-0.918*	-0.795*
	[1.86]	[1.49]	[2.15]	[1.85]	[1.86]	[1.70]
Past Banking Crisis	-0.319	0.098	0.056	-0.328	-0.325	0.039
	[0.71]	[0.23]	[0.13]	[0.73]	[0.73]	[0.12]
Financial Openness	-0.144	-0.151	0.142	-0.137	-0.148	-0.159
	[0.57]	[0.60]	[0.60]	[0.53]	[0.59]	[0.76]
Trade Size	0.073***	0.060***	0.055**	0.073***	0.073***	0.071***
	[6.52]	[3.67]	[2.36]	[6.51]	[6.49]	[5.33]
Current Account	0.024	0.107***	0.112***	0.024	0.023	0.119***
	[0.45]	[4.39]	[3.05]	[0.46]	[0.45]	[4.17]
Economic Growth	-0.432*	-0.035	-0.024	-0.431*	-0.431*	-0.036*
	[1.89]	[1.16]	[0.57]	[1.88]	[1.89]	[1.93]
Fixed Exchange Rate	1.183*	0.236	0.122	1.191*	1.207*	0.765
	[1.87]	[0.33]	[0.22]	[1.85]	[1.89]	[1.49]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Number of Countries	154	92	71	154	154	153
Number of Observations	3,044	1,699	1,146	3,044	3,044	2,397
R-squared	0.4833	0.4487	0.4930	0.4833	0.4825	0.5610

Note: A first order autoregressive process (AR1) accounts for serial correlation. * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. Absolute t-values in brackets.

Table 2.8: OLS Regression analyses to explain changes of foreign reserves as a percentage of GDP without a lagged dependent variable

	1 Whole Sample	2 Whole Sample	3 Whole Sample	4 1990-97	5 98-2013	6 Dem Pol >= 7	7 Auth Pol < 7
Democracy	-0.360**	-0.157	0.556	0.639	0.258		
	[2.56]	[0.36]	[0.79]	[0.45]	[0.22]		
Pre-Democratic Election		-0.407*	-0.928***	-0.436	-1.096***	-1.171***	
		[1.86]	[3.13]	[0.92]	[2.79]	[4.21]	
Post-Democratic Election		-0.358	-0.457	-0.147	-0.552	-0.464	
		[1.18]	[1.26]	[0.39]	[1.17]	[1.33]	
Pre-Authoritarian Election		-0.516	-0.126	-0.111	0.147		0.297
		[1.36]	[0.27]	[0.19]	[0.19]		[0.52]
Post-Authoritarian Election		-1.011	-0.935	-0.329	-1.081		-0.958
		[1.47]	[1.34]	[0.62]	[1.41]		[1.32]
Irregular Election		0.061	-0.019	-0.428	0.136	1.303***	-1.170
		[0.17]	[0.04]	[0.72]	[0.22]	[2.68]	[1.59]
Democratic Veto Players t-1		-0.935	-2.659**	-2.016	-2.033	-1.365	
		[1.49]	[2.11]	[1.13]	[1.20]	[1.30]	
Authoritarian Veto Players t-1		-0.636	-1.027	-3.692**	-0.272		-1.651
		[1.01]	[0.96]	[2.36]	[0.17]		[1.30]
Irregular Central Bank Turnover		0.473*	-0.235	0.077	-0.104	0.577	-1.087
		[1.67]	[0.43]	[0.19]	[0.16]	[1.17]	[1.15]
Euro Membership			-2.515**		-5.773***	-1.586**	
			[2.51]		[3.88]	[2.29]	
Left Government			0.125	-0.134	0.526	-0.035	-0.671
			[0.46]	[0.42]	[1.12]	[0.19]	[0.78]
Banking Crisis			-1.812*	-1.553***	-1.959	-0.284	-2.853**
			[1.81]	[3.42]	[1.27]	[0.46]	[2.24]
Past Banking Crisis			0.128	-0.394	0.202	0.802***	-0.530
			[0.28]	[0.94]	[0.37]	[2.72]	[0.77]
Financial Openness			-0.293**	-0.130	-0.308	-0.317**	-0.228
			[2.04]	[0.60]	[1.45]	[2.12]	[0.81]
Trade Size			0.034**	0.054***	0.028	0.009	0.052*
			[2.04]	[3.70]	[1.58]	[1.18]	[1.93]
Current Account			0.027	0.117***	0.047	0.098***	0.020
			[0.44]	[3.49]	[0.73]	[3.35]	[0.27]
Economic Growth			-0.625	-0.055**	-0.942*	-0.105***	-0.832*
			[1.53]	[2.00]	[1.96]	[3.62]	[1.72]
Fixed Exchange Rate			0.437	0.960*	0.329	-0.216	1.577*
			[1.04]	[1.80]	[0.61]	[0.75]	[1.83]
Time Dummies	No	No	Yes	Yes	Yes	Yes	Yes
Country Dummies	No	No	Yes	Yes	Yes	Yes	Yes
Number of Countries	182	167	154	133	150	92	97
Number of Observations	4,041	3,755	3,041	911	2,130	1,697	1,344
R-squared	0.0009	0.0036	0.2604	0.2192	0.3760	0.1889	0.3597

Note: * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. Absolute t-values in brackets.

Table 2.9: Arellano-Bond estimation to explain changes of foreign reserves as a percentage of GDP

	1 Whole Sample	2 1990-97	3 98-2013	4 Dem Pol >= 7	5 Auth Pol < 7
Democracy	0.364	-0.677	0.835		
	[0.23]	[0.54]	[0.47]		
Pre-Democratic Election	-0.766***	-0.713	-0.989**	-0.956***	
	[2.60]	[1.54]	[2.56]	[4.34]	
Post-Democratic Election	-0.595*	-0.413	-0.589	-0.462	
	[1.95]	[0.95]	[1.51]	[1.60]	
Pre-Authoritarian Election	0.165	0.070	0.231		0.194
	[0.33]	[0.13]	[0.33]		[0.43]
Post-Authoritarian Election	-0.509	-0.129	-0.570		-0.448
	[1.04]	[0.27]	[0.95]		[0.91]
Irregular Election	0.624	-0.437	1.429*	0.980**	-0.032
	[1.16]	[0.80]	[1.75]	[2.51]	[0.05]
Democratic Veto Players t-1	-1.105	-0.708	-0.194	-0.384	
	[0.48]	[0.26]	[0.07]	[0.36]	
Authoritarian Veto Players t-1	-1.594	-1.522	1.447		-1.639
	[0.95]	[1.15]	[0.56]		[1.40]
Irregular Central Bank Turnover	0.031	-0.230	0.124	0.609	-0.710
	[0.08]	[0.78]	[0.25]	[1.29]	[1.00]
Euro Membership	-5.455*		-6.444**	-5.590**	
	[1.75]		[1.95]	[2.48]	
Left Government	-0.007	0.460	0.339	0.271	0.879
	[0.02]	[0.71]	[0.64]	[0.95]	[0.92]
Banking Crisis	-1.203	-1.379**	-1.085	-0.515	-2.725**
	[1.46]	[2.65]	[1.12]	[0.81]	[2.43]
Past Banking Crisis	0.583	-0.996*	0.901	0.975**	-0.654
	[0.70]	[1.73]	[0.94]	[2.16]	[0.78]
Financial Openness	-0.813**	-0.062	-0.639	-1.118***	-0.008
	[2.11]	[0.18]	[1.10]	[3.42]	[0.02]
Trade Size	0.074***	0.049***	0.068***	0.043***	0.072***
	[3.99]	[3.49]	[3.61]	[3.06]	[3.09]
Current Account	0.102**	0.121***	0.109*	0.162***	0.078
	[1.99]	[4.23]	[1.86]	[4.74]	[1.25]
Economic Growth	-0.517*	-0.040	-0.790**	-0.092***	-0.603*
	[1.89]	[1.50]	[2.34]	[2.72]	[1.77]
Fixed Exchange Rate	0.537	0.311	0.596	-0.799	1.810
	[0.59]	[0.36]	[0.57]	[1.23]	[1.40]
Level Reserves/GDP t-1	-0.388***	-0.581***	-0.364***	-0.295***	-0.238***
	[6.25]	[6.70]	[5.08]	[4.75]	[4.16]
Lagged Dependent Variable	-0.179***	-0.043	-0.145***	0.038	-0.244***
	[5.14]	[1.13]	[5.38]	[1.07]	[11.05]
Time Dummies	Yes	Yes	Yes	Yes	Yes
Number of Countries	154	127	150	92	97
Number of Observations	2,963	867	2,096	1,670	1,293

Note: * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. Absolute z-values in brackets.

Chapter 3

Solving Milton Friedman's Conundrum on Price Stability: The Neglected Role of Reserve Requirements

Abstract

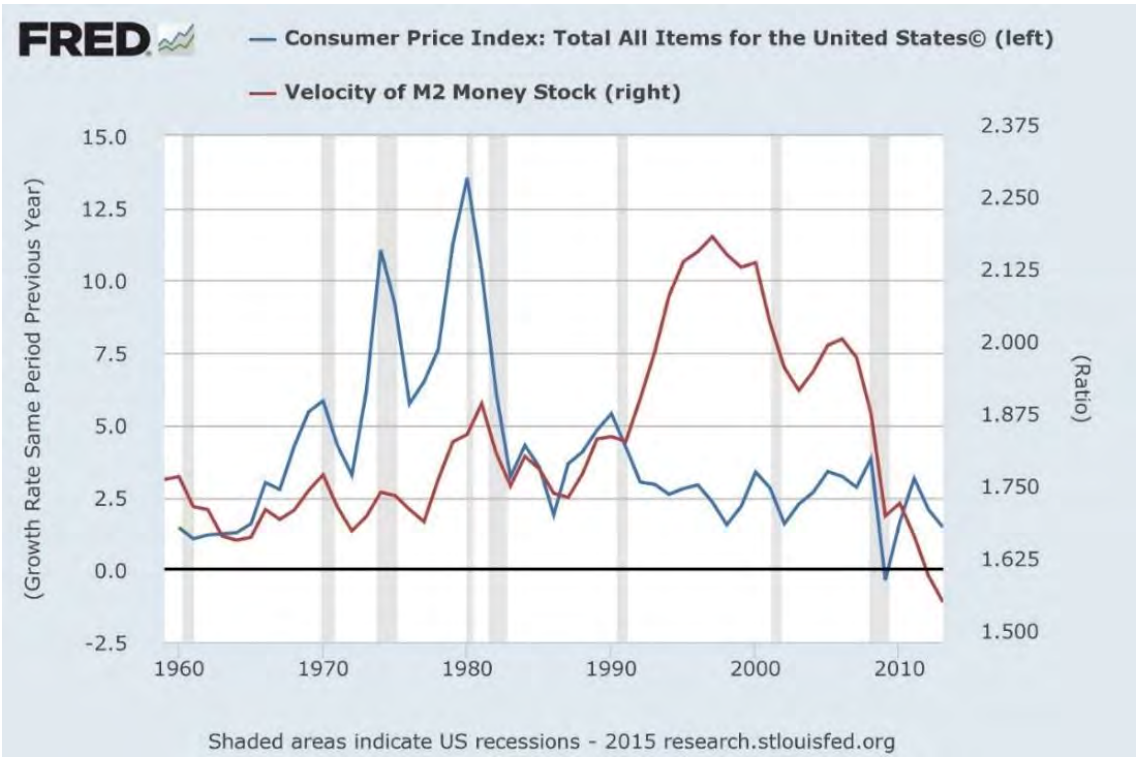
This paper shows that the deregulation of reserve requirements explains why many countries achieved stable inflation rates exactly when velocity became less predictable: In any fractional reserve system, the optimal ratio of reserves holding by banks declines (increases), when velocity goes down (up). As a result of the money multiplier effect, the banking sector only has the leverage to sufficiently offset changes in velocity if reserve requirements are low or non-existent. Drawing on a new dataset for 168 countries with monthly averages of reserve requirements over the period 1990-2013, I show that the ability of the banking sector to offset changes in velocity is conditional on low reserve requirements. While central bank independence also fosters price stability, deregulating reserve requirements ensures that the money supply and the inflation rate are robust to changes in velocity. These results suggest that the new Basel III regulation, which imposes additional liquidity requirements, could have negative consequences for monetary policy-making.

3.1 Introduction

In a Wall Street open-ed in 2003, Milton Friedman (2003) proclaimed that he had revised his negative opinion on the performance of the Federal Reserve (Fed): "The Fed appears to have acquired the thermostat that it had been seeking the whole life" to achieve price stability in recent decades.

What puzzled Friedman (2003) was the fact that the Fed achieved low and stable inflation rates throughout a period in which the velocity of money has started to behave atypically. According to the quantitative equation of exchange, MV = PY, where M is the money supply, V is the velocity of money, P is the price level, and Y is output, the monetary policy of a central bank only shapes inflation rates if velocity remains stable (Friedman 1956; Meltzer 1963). Changes in velocity, thus the inverse of the transaction demand for money, would be reflected in inflation rates – unless central bankers are able to anticipate and offset them. But offsetting changes in velocity is a difficult task due to time lags between monetary policy and prices, requiring that central bankers correctly anticipate changes in velocity for up to two years (Christiano et al. 1999).

Figure 3.1: The relationship between inflation and velocity of M2 in the United States, 1959-2013



As shown by Figure 3.1, velocity, measured as a ratio of nominal GDP to the M2 money supply, was rather stable in the USA until the 1990s, when velocity started to deviate from its long-term upward trend with a strong increase between 1990 and 1997 and a sharp decline until 2003, which continued since the Great Recession. The correlation between velocity and inflation rate was 0.58 between 1959 and 1989, but -0.49 between 1990 and the third quarter of 2008 when the Fed started to pay interest on reserves.

Recent empirical studies also show that velocity has generally become less stable. The strong correlation between interest rate and the standard monetary aggregates has increasingly disappeared since the late 1980s or early 1990s (Teles and Zhou 2005; Ireland 2009; Berentsen et al. 2015; Lucas and Nicolini 2015).[11]

The time lags of monetary policy in combination with the instability of the velocity of money lead to what I call *Friedman's Conundrum*: Why have the Fed and other Western central banks succeeded in delivering price stability, exactly when velocity started to misbehave? Or, to put it differently, why have central bankers apparently become better in anticipating changes in velocity, when velocity became more erratic?

Friedman (2003) suggests that central banks achieved low inflation rates because they adopted the belief that inflation is a monetary phenomenon. Similarly, the vast literature on central bank independence establishes a theoretical and empirical link between low inflation rates and the central bank's ability to conduct an independent monetary policy without political interference (e. g., Kydland and Prescott 1977; Rogoff 1985; Alesina and Summers 1993; Cukierman 2008; Klomp and de Haan 2010a, 2010b). But such explanations are insufficient to explain stable inflation rates; they do not explain why monetarist central bankers should be better in predicting changes in velocity in a volatile environment.[12]

This article argues that price stability has improved because of the substantial deregulation of banking reserve requirements in the world, which gave the private banking system the leverage to sufficiently offset changes in velocity. In the American case, the abolition of reserve requirements that the Fed initiated in December 1990 on components of

[11] Some scholars have constructed new measures for monetary aggregates for which velocity remains stable. This would only be relevant for this analysis if central bank authorities would have used these recent measures to anticipate changes in velocity.

[12] In fact, Tetlock (2005) shows in a long-term study that experts tend to fail to make adequate predictions on economic or political outcomes: Experts perform only slightly better than randomness, and they are outperformed by simple statistical extrapolations.

M2 and M3 coincides with the disappearance of the robust association between velocity and inflation in the US since the 1990s. There also appears to be a similar phenomenon throughout the world: The correlation coefficient for inflation and velocity of M2 is 0.03 for countries with reserve requirements of 1 percent or lower over the period 1990-2013. The higher the reserve requirements, the stronger the correlation between inflation and velocity, reaching a correlation coefficient of 0.46 for countries with reserve requirements of above 15 percent.

Reserve requirements have become less relevant for monetary authorities to directly manage the money supply. But they remain crucial for monetary outcomes as they shape the demand-driven changes in the supply of inside money created by financial institutions (Selgin 1988: 70). The abolition of reserve requirements does not imply that banks would not hold any reserves. Rather, banks would still be limited in their lending activities as they have to respond to the liquidity demands of their customers. They would be forced to keep enough precautionary reserves to meet the amount of payments and withdrawals that are requested.

Thus, the level of reserves holding by financial institutions responds contrarily to changes in the velocity of money: As velocity of money goes down (up), the optimal ratio of reserves holding of banks declines (increases). This, in turn, induces banks to increase (decrease) the money supply. The banking sector provides an endogenous market mechanism that stabilizes the monetary system and aggregate demand (Hayek 1978; Selgin 1988, 1994, 2001, 2002; White 1999; Dynan et al. 2006; Henderson and Hummel 2008). Consequently, the inflation rate should also be robust to deviations in velocity.

While a fractional banking system should generally have the tendency to offset changes in velocity, the magnitude of this offsetting effect depends on the percentage rate of reserve requirements. The money multiplier model suggests that inside money, created by the private banking system, increases exponentially for any percentage point decrease in reserve requirements. Thus, the banking sector can only offset changes in velocity sufficiently, if reserve requirements are low or non-existent.

However, the empirical evidence for this mechanism rests on historical case studies or anecdotal evidence, presumably because panel data on reserve requirements has not been readily available. This paper introduces a collection of reserve requirement data for up to 168 countries over the period 1990-2013. Based on this novel panel dataset, the empirical analysis shows that central bank independence fosters price stability, and also reveals the crucial role of reserve requirements: Changes in velocity are offsetted by the banking

sector, and the inflation rate tends to be robust to changes in velocity only if reserve requirements are deregulated.

These results suggest that reserve requirements still matter for monetary policy-making, which, in turn, has implications for the third installment of the Basel Accords. Basel III imposes additional liquidity requirements on banks as macro-prudential measures. This article, however, suggests that higher reserve requirements have an adverse effect on monetary stability – a finding that still needs to be addressed in the debates on reforming banking regulation.

The article begins with an overview of the evolving functions of reserve requirements from a classical monetary tool to a key prudential principle of Basel III. The next section discusses why deregulating reserve requirements should be associated with price stability. This is followed by introducing a new dataset on reserve requirements, which is subsequently used in the empirical section to evaluate the monetary impact of reserve requirements.

3.2 The evolving functions of reserve requirements

3.2.1 The economic impact of reserve requirements

Reserve requirements impose on banks the requirement of holding a certain proportion of their customer deposits as highly liquid assets (e. g., vault cash or central bank reserves). For instance, in an economy with 10 percent reserve requirements, $100 of deposits in a bank must be secured by holding $10 vault cash or central bank reserves. If the monetary authorities reduce this requirement to 5 percent, the bank can increase their lending by $5.

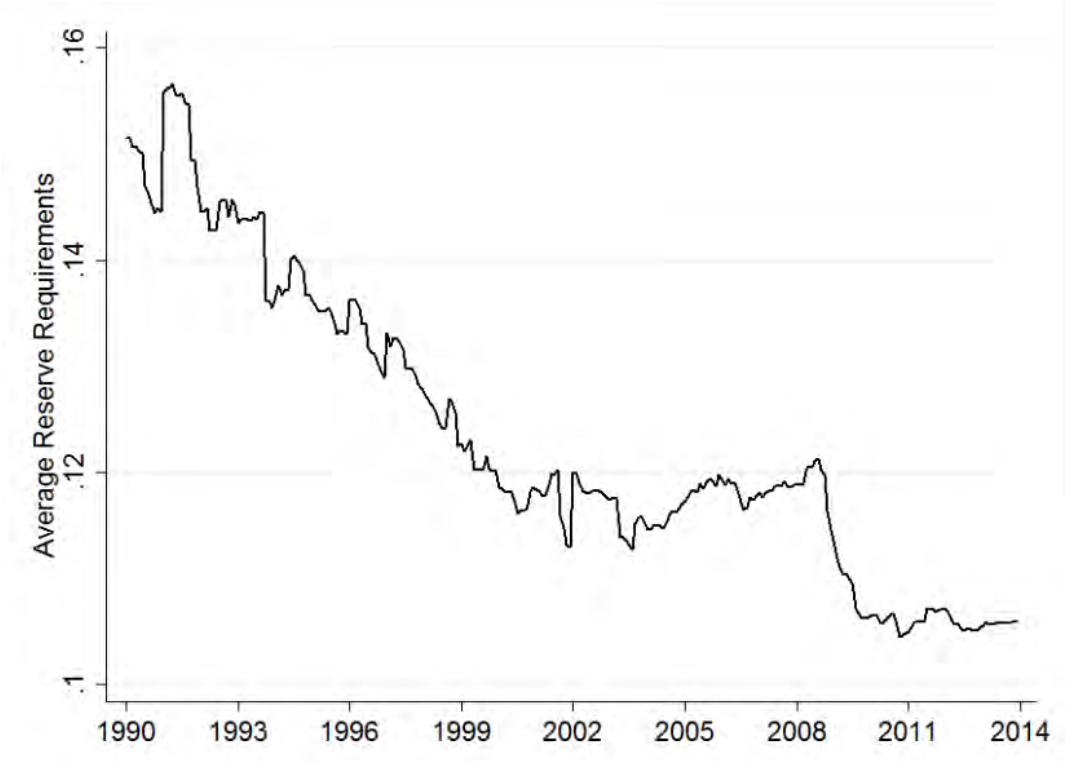
Essentially, reserve requirements define the nature of banking and are primary to other banking regulations. A banking system with 100 percent reserve requirements would cease to provide financial intermediation, and would be more aptly described as a warehouse system. Reserve requirements represent a tax for the banking system (Feinman 1993; Hardy 1993). A reduction in reserve requirements is associated with an increase in bank lending and lower interest rate, leading to a short-term boom in economic activity with a lower unemployment rate and higher economic output (Loungani and Rush 1995; Glocker and Towbin 2012; Tovar et al. 2012). Furthermore, a decrease in the reserve tax tends to attract more investment, which in turn appreciates the exchange rate (Reinhart and Reinhart 1999; Glocker and Towbin 2011; Terrier et al. 2011). In emerging markets,

reserve requirements have become a major tool for managing capital inflows, and for applying counter-cyclical policies over the business cycle (Reinhart and Reinhart 1999; Cordella et al. 2014).

3.2.2 Reserve requirements as a prudential measure of Basel III

As banks tend to increase their lending as a response to a reduction in reserve requirements, they have less liquidity available to weather an unexpected financial turmoil. Figure 3.2 shows that the world has witnessed a steady reduction in reserve requirements since the early 1990s. Some countries have even abolished reserve requirements completely, such as Australia, Canada, Denmark, Mexico, New Zealand, Norway, Sweden, or the United Kingdom.

Figure 3.2: Global development of reserve requirements, 1990-2013 (monthly averages)



Reserve requirements were increasingly perceived as a tax that cause inefficiencies in banking, particularly as financial globalization and innovations confronted depository institutions with competition from non-depository financial institutions, which were exempt from reserve requirements (Fama 1980, 1983; Di Giorgio 1999: 1033; Lown and Wood 2003). Financial innovations such as deposit-sweeping software also helped financial institutions to evade many reserve requirements (VanHoose and Humphrey 2001).

Many international regulators drew the conclusion from the financial crisis that reserve requirements might have a prudential role, as "the turmoil demonstrated the central importance that effective liquidity risk management practices and high liquidity buffers play in maintaining institutional and systemic resilience in the face of shocks" (FSB 2008: 16; Gray 2011).

The third installment of the Basel Accords includes liquidity requirements as a key prudential principle for regulating banks. In contrast to reserve requirements, which is essentially a cash holding requirement, liquidity requirements demand that banks keep other highly liquid assets, often government bonds. Banks will be required to keep enough high-quality liquid assets to potentially cover their 30-days net cash outflows. The first stage of the liquidity requirements was introduced at 60 percent on 1 January, 2015. The liquidity requirements are scheduled to increase by ten percent annually, until they are fully implemented by 1 January, 2019.

However, the prudential role of reserve requirements is debatable. An increase in reserve requirements suggest that banks have to increase their reserves at the expense of loans, which actually could cause an economic downturn. The most prominent example is the decision by the Fed to double reserve requirements in three steps in 1936-37 in order to dampen inflationary pressures. Friedman and Schwartz (1963) argue that the doubling of reserve requirements has caused the 1937-38 recession within the Depression of the U.S. economy.[13]

Reserve requirements might actually prevent banks from drawing on their liquidity when a financial turmoil occurs. As noted by Alchian and Allen (1972: 708), "to rely upon a reserve requirement for the meeting of cash-withdrawal demands of banks' customers is analogous to trying to protect a community from fire by requiring that a large water tank be kept full at all times: the water is useless in case of emergency if it cannot be drawn from the tank."

3.2.3 Reserve requirements as a monetary policy tool

Reserve requirements are a traditional monetary policy tool of central banks to directly control demand for reserves. Monetary authorities can use reserve requirements to control the money multiplier, and to obtain a better predictability of reserve demand when conducting open market operations (Greenspan 1992 [cit. in Weiner 1992]; Hardy 1997).

[13] This interpretation was recently challenged by Calomiris et al. (2011) and Park and Van Horn (2015).

Low reserve requirements should generally be associated with low long-term inflation: The lower the reserve requirements in an economy, the lower the demand for outside (central bank) money – which implies that the government could earn less through seigniorage at a given price level; or, similarly, when reserve requirements are lower, the government benefits less from any percentage increase in inflation (Hummel 2010). Brock (1989) finds a strong empirical association between low reserve requirements and low inflation.

The reduction of reserve requirements has expedited the declining importance of the traditional bank-lending channel in advanced economies (Bernanke and Gertler 1995; Diamond and Rajan 2006; Bernanke 2007; Disyatat 2011; Carpenter and Demiralp 2012). In the debate on the monetary transmission mechanism, reserve requirements are considered to be of "minor importance" (Friedman 2003), or "not an important aspect of monetary policy frameworks in most advanced economies today" (McLeay et al. 2014: 24). Many central banks have shifted from controlling reserves to target short-term interest rates. They can effectively implement monetary policy by open-market operations, and market incentives ensure that banks target a zero balance. (Sellon and Weiner 1996; Clinton 1997).

Although banks would still require reserves for clearing balances in the interbank market in a system without reserve requirements, this demand is relatively small in comparison to the total amount of daily transactions. Thus, unexpected variations in this demand could cause a spread between the market and policy interest rate (Woodford 2002: 88). In fact, studies show that there is a greater possibility that the overnight market interest rate will diverge from the central bank's target rate in the short-run, if there are no reserve requirements (Bennett and Hilton 1997; Clouse and Elmendorf 1997; VanHoose and Humphrey 2001; Demiralp and Farley 2005; Nautz and Schmidt 2009).

A proposed solution that could strengthen a central bank's control over the overnight interest rate is to pay interest on (excess) reserves (Woodford 2002: 90; Kashyap and Stein 2012). Monetary authorities should have a greater control over the overnight market rate, because interest on reserves create a lower bound at the rate that the central bank intends to target. This would give central banks a credible "exit strategy" to return to higher interest rates after a period of quantitative easing (Bernanke 2009). The advent of the financial crisis caused a substantial discrepancy between the actual U.S. federal funds rate and the targeted rate, prompting Congress to follow the Fed's request to immediately implement interest on reserves in October 2008 (Bech and Klee 2011).

The interest-on-reserves policy led to a drastic increase of excess reserves held by U. S. banks. In contrast to increasing reserve requirements, depository institutions do not incur a reserve tax, but rather receive a subsidy from the general public for holding risk-free central bank reserves at close to market rates.

Besides the discussed functions of reserve requirements, the next section will argue that reserve requirements are also important for banks to offset short-term changes in velocity.

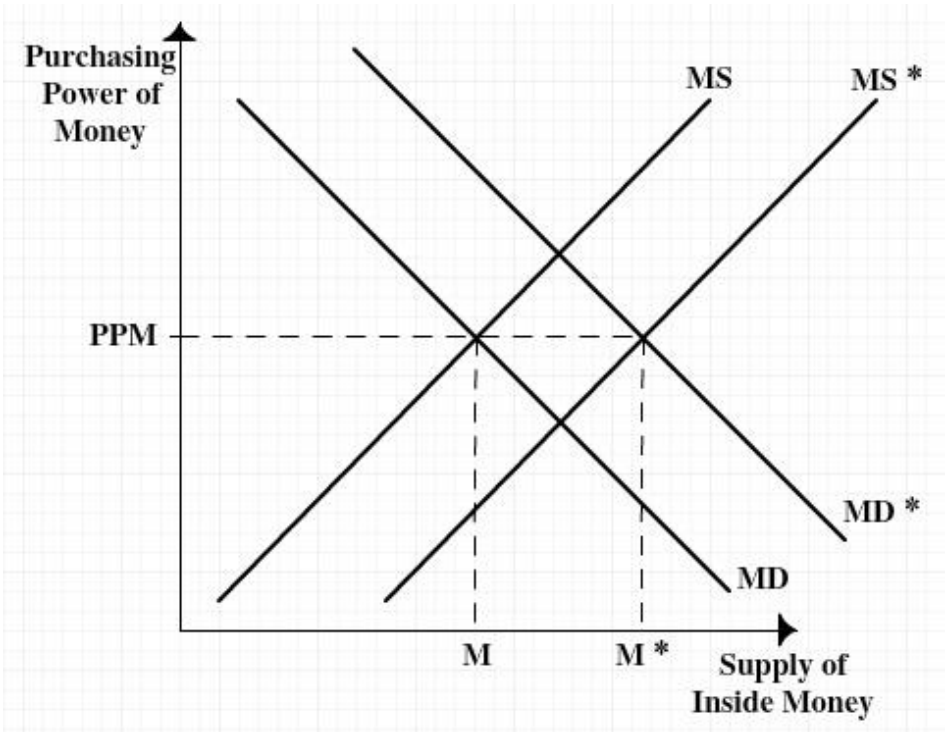
3.3 Solving Friedman's Conundrum: How deregulating reserve requirements foster price stability

Imagine a university cafeteria that is obliged to provide lunch meals to all university members at a fixed price. Yet, most of the university members do not have their daily luncheon at the university cafeteria. As a consequence, it would be economically inefficient if the cafeteria prepares meals for all university members, as most of the meals would be wasted. Instead, the economically efficient solution would be to allow the cafeteria to adjust the supply of meals to the expected daily amount of visitors. The supply of meals by the cafeteria would be sensitive to short-term changes in the demand for meals (e. g., during exam week) as well as to long-term developments (e. g., an increase in the number of other restaurants on campus).

Similarly, the practice of airlines to overbook seats in excess of availability should also be sensitive to the turnout rate of passengers. As the turnout rate decreases, i. e. less customers show up for their booked flights, the airline has an incentive to increase overbooking in order to maximize profits. Vice versa, when more passengers show up for their flights, airlines should reduce the number of overbooked seats in order to avoid bumping some of their passengers for whom they would have to pay a compensation.

Both examples portray how the principle of fractional reserve banking applies to other sectors of the economy. Although depository institutions, such as commercial banks, are obliged to respond to the payment demands by their customers, only a small fraction of customers regularly request withdrawals at a given period. Thus, profit-seeking depository institutions have an incentive to transform most of their liabilities into less liquid but higher interest-earning assets. Banks would still keep an amount of highly liquid assets – the precautionary reserves – that should be sufficient to meet the daily demand for money by customers in order to evade penalty rates or disreputable banking closures.

Figure 3.3: The velocity offsetting effect



As banks consequently do not want to hold too much or too little precautionary reserves, they are sensitive to changes in the demand for money. On the aggregate, the banking system will adjust the level of reserves holding accordingly, as illustrated by Figure 3.3: As the demand of money, thus the inverse of velocity, goes up to MD*, the optimal ratio of reserves holding of banks declines. This, in turn, induces banks to reduce their reserves and to increase their lending activities, illustrated by the outward shift of the supply of inside money to MS*. This velocity offsetting effect would suggest an endogenous market mechanism that stabilizes the monetary system and aggregate demand in the short-run (Hayek 1978; Selgin 1988, 1994, 2001, 2002; White 1999; Dynan et al. 2006; Henderson and Hummel 2008).

What distinguishes fractional reserve system in banking from other sectors such as airline overbooking is the multiplication effect. The decision by banks to expand (recall) loans increases (reduces) the deposits at successive banks, which, in turn, leads to a further expansion (reduction) in the supply of inside money. The multiplication effect of fractional reserve banking intensifies the offsetting effect.

While the velocity offsetting mechanism should operate in any fractional reserve system, the magnitude of the money multiplier depends on the percentage rate of reserve requirements: A unit increase in reserve requirements exponentially reduces the velocity

offsetting effect. As a consequence, the banking sector can only sufficiently offset changes in velocity if reserve requirements are low or non-existent.

A simple money multiplier model, which is derived from the standard definitions of the monetary base (MB) and money supply (MS), illustrates the described influence of reserve requirement. MB is defined as the following:

$$MB = C + R \tag{1}$$

where C = Total currency circulating among the public, and R = Total reserves held by commercial banks. C and R can be expressed as:

$$C = CR * D \tag{2}$$

$$R = RR * D + PR * D \tag{3}$$

where D = Demand deposits, CR = The currency-to-deposit ratio $\left(\frac{C}{D}\right)$, measuring the currency that the public hold as a ratio of their deposits, RR = Reserve requirement ratio, PR = Precautionary reserves ratio, measuring the excess reserves that banks hold as a ratio of their deposits.

Substituting equations (2) and (3) into equation (1) and factoring out D:

$$MB = (CR + RR + PR) * D \tag{4}$$

Dividing equation (4) by $(CR + RR + PR)$ solves it for D:

$$D = \frac{1}{CR + RR + PR} * MB \tag{5}$$

The money supply (MS) can be defined as:

$$MS = C + D \tag{6}$$

Substituting equation (2) into equation (6) and factoring out D:

$$MS = (CR + 1) * D \tag{7}$$

Finally, substituting equation (5) into equation (7):

$$MS = (CR + 1) * \frac{1}{CR + RR + PR} * MB => \frac{1}{RR + PR} * MB \tag{8}$$

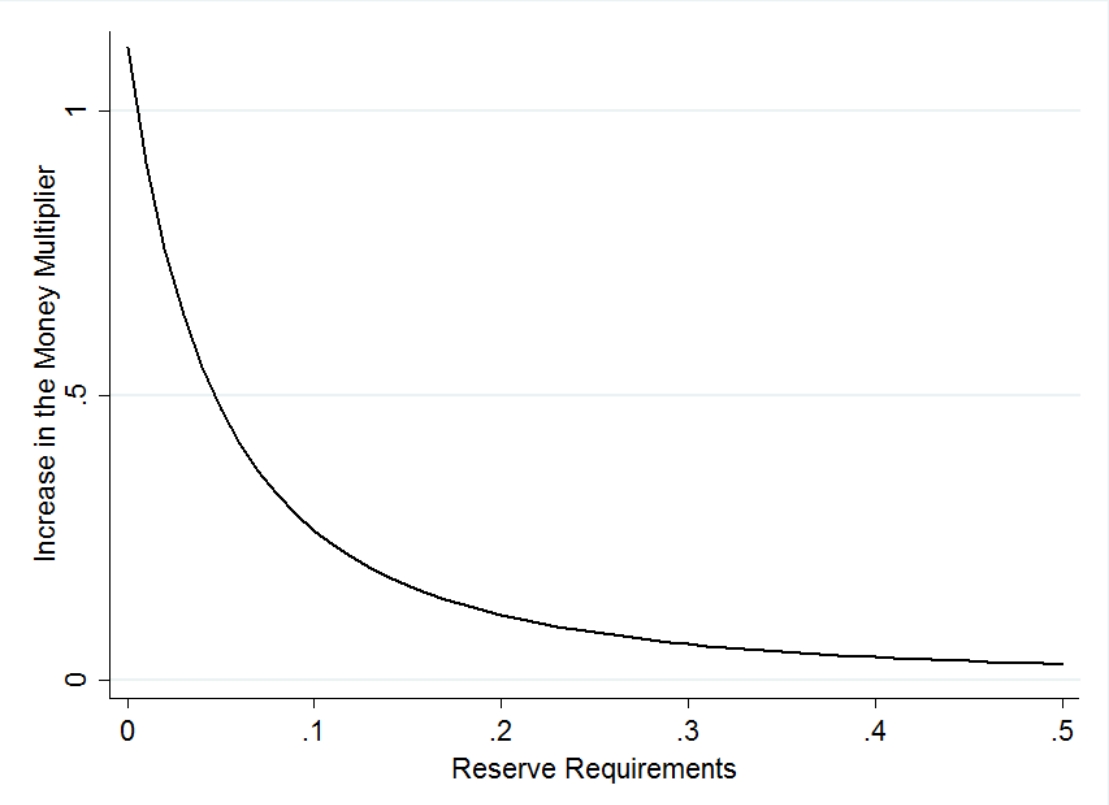
The money multiplier (MM) of a fractional reserve banking system, which connects the monetary base to the money supply, is the reciprocal of the ratio of liquid assets held

by the banking system, which consists of the reserves requirement ratio, exogenously determined by the central bank, and the precautionary reserves ratio, determined by the banking sector:

$$MM = \frac{1}{RR + PR} \tag{9}$$

An example should illustrate that the banking system can only sufficiently offset changes in velocity if reserve requirements are low. Imagine an economy in which the banking systems hold precautionary reserves of 10 percent at period t. A fall in velocity at period t+1 allows banks to reduce their precautionary reserves by one percentage point to 9 percent of their total liabilities. Figure 3.4 depicts the results of changes in the money multiplier based on equation (9) for different reserve requirements ranging from zero to 50 percent.

Figure 3.4: Money multiplier effect and reserve requirements



The simulation shows that the money multiplier hardly increases when reserve requirements are high, indicating that the velocity offsetting mechanism might be too weak to

lead to countercyclical effects. In contrast, the money multiplier exponentially increases at lower reserve requirements.[14]

Simulating the opposite effect, an increase in velocity that induces banks to increase their precautionary reserves by one percent would yield an inverse effect with the same magnitude: The money multiplier would hardly decrease in economies with high reserve requirements, while the money multiplier would exponentially decrease if reserve requirements are low.

The simulation suggests that the velocity offsetting mechanism of fractional reserve banking is only strong enough to support price stability with low or non-existent reserve requirements.[15] The discussion leads to the two following hypotheses regarding the impact of reserve requirements:

H1: If reserve requirements are low, an increase in velocity should be negatively associated with broader monetary aggregates that are mostly determined by the banking system (e. g., M2) (*velocity offsetting effect*).
H2: As a consequence of the mechanism portrayed by H1, if reserve requirements are low, the inflation rate should be robust to changes in velocity (*inflation stability effect*).

3.4 Empirical section

3.4.1 A new dataset on reserve requirements

Studies on the economic effects of reserve requirements are often based on single cases or a small number of countries, because adequate time-series cross-sectional data for a large sample of countries has up to now been unavailable for reserve requirements.

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[14] This includes liquidity requirements. As noted above, liquidity requirements allow banks to hold other highly liquid assets to meet their obligations. But they should have the same effect on monetary stability as traditional reserve requirements, because they also impose a ratio that banks have to hold. Thus, the higher the liquidity requirements the weaker the potential velocity offsetting effect as shown in the simulation of Figure 3.4.

[15] An alternative equation for capturing the relationship between changes in velocity and changes in precautionary reserves is the so-called Square Root Law. The Square Root Law states that the optimal ratio of reserve holdings will change by the square root of the ratio change in transaction demand (Patinkin 1956; Olivera 1971; Selgin 1988, 2001). In contrast, Baltensperger (1974: 210) shows in a model that incorporates planning and information on the volume of the transaction that the response in precautionary reserves can differ from one half and should rather approximate one. Nonetheless, incorporating the Square Root Law into equation (9) would not change the principal results of the simulations, but only reduce the general magnitude of the money multiplier.

Gray (2011)'s cross-sectional survey of 121 central banks provides reserve requirements data only for 2010. Barth et al. (2001)'s banking regulation dataset includes three measurements of reserve requirements for up to 143 countries in their 2000, 2003, and 2007 editions. Reinhart and Reinhart (2008) compile a cross-country dataset from Internet sources over the 20th century up until 2007. While this collection provides a comprehensive country coverage, it is not a readily available time-series, as annual data entries only exist when new information on reserve requirements was detected.

Abiad et al. (2008)'s database for financial reforms covers 91 economies over the period 1973–2005, and also includes a measurement for reserve requirements. However, reserve requirements are transformed into a trichotomous subcategory, ranging from zero, if average reserve requirements are above 20 percent, to two, if they are below 10 percent. This classification is too crude to analyze the monetary effects of reserve requirements. Shim et al. (2013)'s database for policy actions on housing markets also includes changes in reserve requirements for 60 member states of the Bank for International Settlements (BIS) on a monthly basis from January 1990 to June 2012. Yet, the coverage is very unbalanced ranging from the whole period for 14 countries to a few years for others. Cordella et al. (2014) was the most comprehensive time-series cross-sectional dataset on reserve requirements. The dataset was compiled as part of a World Bank Latin American study on macro-prudential policy. It consists of the end-of-the-quarter reserve requirements for an unbalanced sample of 61 central banks over the period 1970-2011.

This paper introduces a new dataset for reserve requirements that draws on the previous and new sources to construct a reserve requirements dataset based on monthly averages for 168 countries over the period 1990-2013.

Table 3.6 in the appendix shows the list of countries covered by the dataset. The data collection procedure was the following: Central banks were directly contacted, and primary government webpage sources, such as central banks' annual reports or IMF reports, were analyzed. In addition to consulting the previous databases, an Internet search was conducted to discover information on reserve requirements among news reports, research papers and published articles for any missing country.

In the case of multiple reserve requirements in a country, all different categories are provided, which are categorized into monthly reserve requirements for demand deposits, savings deposits, and time deposits for domestic, and (if applicable) foreign currencies.

Moreover, some countries, particularly in South Asia and the Pacific Islands, impose liquidity requirements in addition or as a substitute for reserve requirements. Liquidity requirements for local and foreign currencies are provided as additional categories.

Besides the comprehensive coverage and the categorization into different reserve requirement ratios, the monthly-average measurement is also more precise relative to end-period measurement, particularly if one is interested in short-term effects of reserve requirements.

3.4.2 Data description and model specifications

The empirical analysis is a time-series cross-sectional analysis based on annual data over the period 1990-2013. The main regression model has the following form:

$$\Delta M2/GDP_{it} \text{ or } Inflation_{it} = \alpha + \beta\, Average\ Reserve\ Requirements_{it} + \gamma\, \Delta Velocity_{it} + \delta\, Interaction\ Term_{it} + \Sigma_j\, \varepsilon_j\, Control\ Variables_{itj} + \pi_i + \tau_t + u_{it}$$

with i = 1, …, 165 (number of countries); t = 1, …, 24 (number of years); j = 1, …, 7 (number of other explanatory variables)

where $\Delta M2/GDP_{it}$ is the dependent variable to test H1. The percentage change of M2 is a broad monetary aggregate that is strongly determined by the banking sector. In order to have a common comparable denominator, M2 is divided by nominal GDP. The annual inflation rate (GDP deflator) is the relevant dependent variable to evaluate H2.[16]

If multiple reserve requirements exist in a country, $Average\ Reserve\ Requirements_{it}$ is calculated based on the equally weighted reserve requirements for demand, saving, and time deposits in local and foreign currency. As they are hardly distinguishable from reserve requirements, liquidity requirements are added if they exist in a country.[17] $\Delta Velocity_{it}$ is the annual percentage change in the velocity of M2 (nominal GDP/M2).

The interaction term between average reserve requirements and percentage changes of velocity is the explanatory variable of interest. The velocity offsetting effect of H1 would be confirmed if the interaction term has a positive influence on percentage changes in M2/GDP: At low levels of reserve requirements, a unit change in velocity should approximate a decrease of M2/GDP by one unit (perfect offsetting), which comes closer to zero

[16] Countries with a monthly inflation rate above 10 percent over a year (annual inflation rate above 213.84 percent) are removed from the analysis, as these few outliers would distort the statistical estimates.

[17] As an alternative measurement, the average reserve requirements for domestic deposits and for domestic demand deposits are also used without liquidity requirements in Tables 2.7-2.10 in the appendix.

as the percentage rate of reserve requirements increases (imperfect offsetting). In order to test for the inflation stability effect of H2, we should observe that changes in velocity have a higher substantial impact on inflation rates at higher levels of reserve requirements, which should become smaller at lower reserve ratios.

The following factors might also influence the proposed mechanism of the hypotheses, and are part of the analysis as control variables:

Δ*Monetary Base*$_{it}$: As inflation is foremost a monetary phenomenon, the central bank can strongly influence the size and fluctuation of the monetary aggregates and inflation. Therefore, the most important control variable is measuring percentage changes in the monetary base. The monetary base is the narrowest measurement of money, and is under the control of the central bank.[18]

GDP per Capita (log)$_{it}$ and *M2/GDP*$_{it}$: Economic and financial development could also be crucial for the validity of the hypotheses, as a higher level of development reduces required and precautionary reserves holdings. Financial innovations such as deposit-sweeping software make it easier for financial institutions to avoid reserve requirements (VanHoose and Humphrey 2001). Higher financial development is also associated with more efficient interbank markets and lower operation costs (Agénor and Aynaoui 2010). In contrast, the markets for loanable funds or equity are underdeveloped in low-income countries, where a few banks often have oligarchic power (Khemraj 2009). Saxegaard (2006) shows that banks in many low-income countries in Sub-Saharan Africa hold a substantial amount of excess liquidity. For instance, the member states of the CFA franc currency unions have relatively low reserve requirements. Yet, the annual central bank report reveals that the accumulated reserves by banks is more than double as high as prescribed by reserve requirements (BCEAO 2012: 63-4) – a figure that has been constant or sometimes even higher since 2001 (Kireyev 2015: 14)

Thus, the proposed velocity offsetting mechanism would not apply to low income countries with a rudimentary banking system, if a reduction in reserve requirements does not lead to an increase in lending activity, but to higher levels of excess reserves. As a consequence, the natural logarithm of GDP per capita is part of the analysis as well as the

[18] The monetary base is per definition a small proportion of M2. The actual correlation coefficient between changes in the monetary base and changes in M2/GDP is -0.0152 (3,912 observations).

level variable of M2/GDP, which is a popular proxy measurement for financial development. The lagged level of M2/GDP also controls for convergence effects when changes of M2/GDP is the dependent variable.

Economic Growth$_{it}$, *Recession*$_{it}$, and *Bank Crisis*$_{it}$: The velocity offsetting mechanism rests on the assumption that there are investment opportunities for banks in an economy. In a recession or a period of financial turmoil, however, banks might be reluctant to increase their lending activities and rather hoard their liquidity. This 'credit crunch' could thwart the proposed velocity offsetting mechanism, particularly in the advent of a financial crisis. For instance, as pointed out by Agénor et al. (2004), Thai banks suffered from an excess accumulation of reserves beyond the required ratio in the advent of the Asian Financial Crisis. Consequently, GDP growth, and dummies for a recession (if annual economic growth is negative) and for a banking crisis (Laeven and Valencia 2008, 2012) are included in the analysis. GDP growth also accounts for changes in the denominator when changes of M2/GDP is the dependent variable.

Deposit Insurance$_{it}$: The existence of a deposit insurance scheme effectively makes bank runs less likely, as the government guarantees for customers' deposits up to a certain amount. A deposit insurance scheme reduces the necessity for banks to hold liquidity in excess of expected clearing and settlement of payments. Thus, a dummy variable measures if a country has an explicit deposit insurance scheme (Demirgüç-Kunt et al. 2013).

The descriptive statistics of all variables are shown in Table 3.1. π_i denotes country fixed effects to control for country-specific time-invariant effects, such as the legal system; τ_t represents annual time effects to adjust for common positive or negative shocks (e. g., changes in the general opportunity cost of holding reserves); u_{it} is the error term. The empirical analysis is based on a generalized least squares (GLS) Prais-Winsten transformation with a first order autoregressive process (AR1) in order to account for serial correlation of the dependent variable, and with robust standard errors to account for heteroscedasticity. The Prais-Winsten transformation is a viable choice for estimating long-term effects on the trend-ridden dependent variable, as in the case of inflation (Plümper et al. 2005: 349).[19]

[19] Estimating the models with an Arellano-Bond Dynamic Panel GMM Estimator, Tables 3.11-3.14 in the appendix show that the main results of the empirical analysis do not change.

Table 3.1: Descriptive statistics

	Obs	Min	Max	Mean	Std. dev.
Δ M2/GDP	3697	-89.08	102.95	1.17	7.63
Deflator	4326	-31.57	200.10	10.12	19.10
Δ Velocity	3697	-90.87	459.32	-1.30	18.20
Av. Reserve Requirements	3288	0	0.8525	0.122	0.117
Av. Domestic Reserve Requirements	3288	0	0.8525	0.087	0.079
Reserve Requirements on Demand Deposits	3288	0	0.865	0.095	0.090
Δ Monetary Base	3770	-68.81	2690.23	18.75	62.83
GDP per Capita (log)	4257	3.91	11.98	8.20	1.63
M2/GDP t-1	3608	0.83	683.09	59.70	55.28
Economic Growth	4326	-64.05	149.97	3.92	6.75
Recession	4326	0	1	0.15	0.36
Bank Crisis	3288	0	1	0.02	0.14
Deposit Insurance	3288	0	1	0.50	0.50
Central Bank Independence	1554	0.16	0.96	0.60	0.22

Additionally, the level of development is used to divide the countries into different subsamples based on their World Bank income classification. The thresholds are: Low income countries have a GNI per capita below 1,045 USD (average reserve requirements of 17.2 percent), lower-middle income countries are placed between 1,046 and 4,125 USD (average reserve requirements of 14.4 percent), and upper-middle income countries and high-income countries are separated by the threshold of 12,746 USD (average reserve requirements of 11.8 and 5.7 percent). In another subsample, the 14 member states of the CFA franc currency unions with average reserve requirements of 5.7 percent are removed. The final subsample is based on BIS membership (average reserve requirements of 7.2 percent), as they are formally required to oblige with the Basel regulatory framework. The reserve requirement data from Cordella et al. (2014) (averaging 7.9 percent) is also used for the empirical analysis.

3.4.3 Empirical analysis

Table 3.2 shows the regression results for seven different models with percentage changes in M2 as a percentage of GDP as dependent variable. The first model includes all countries; Model 2 removes CFA franc currency member states. The models 3-5 split the sample based on income categories into lower-middle income countries or higher (Model 3), upper-middle income countries or higher (Model 4), and high-income countries (Model 5). Model 6 is a subsample of BIS member states, and reserve requirement data by Cordella et al. (2014) are used in model 7.

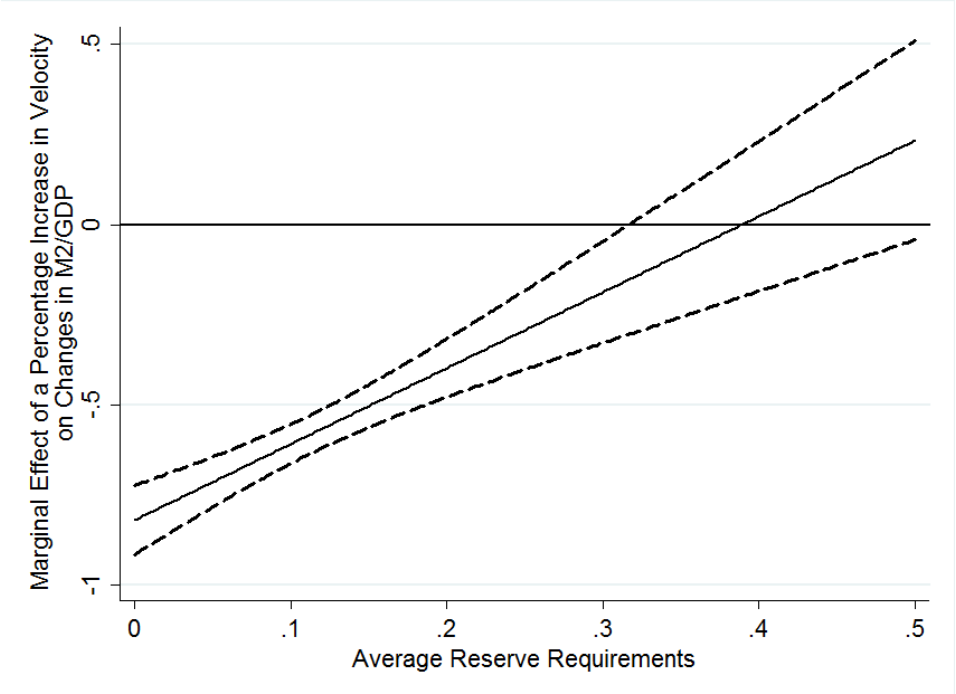
Table 3.2: GLS Prais-Winsten regression analyses to explain ΔM2/GDP

	1 All	2 No CFA franc	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Interaction Term	0.291	0.713***	1.147***	1.115***	2.157***	2.068***	2.571***
Av. RR * Δ Velocity	[1.02]	[2.94]	[3.88]	[3.17]	[4.49]	[4.03]	[4.88]
Δ Velocity	-0.432***	-0.555***	-0.613***	-0.745***	-0.945***	-0.786***	-0.745***
	[7.19]	[14.37]	[13.14]	[13.58]	[12.95]	[11.89]	[10.83]
Av. Reserve Requirements	1.123	3.116**	2.383	2.491	-44.161***	2.463	5.487
	[0.80]	[1.98]	[0.98]	[0.58]	[3.12]	[0.69]	[1.17]
Δ Monetary Base	0.006	0.009	0.002	0.003	0.001	-0.004	-0.006
	[0.72]	[0.98]	[0.53]	[0.50]	[0.11]	[0.72]	[1.01]
GDP per Capita (log)	1.859***	1.671**	1.274	2.221*	0.169	1.243	0.075
	[2.62]	[2.22]	[1.44]	[1.80]	[0.10]	[1.09]	[0.05]
M2/GDP t-1	-0.039**	-0.031**	-0.032*	-0.019	-0.012	-0.012	-0.055
	[2.31]	[2.01]	[1.91]	[1.07]	[0.56]	[0.53]	[1.58]
Economic Growth	-0.059	-0.083**	-0.124***	-0.069	0.020	-0.085	-0.054
	[1.48]	[2.15]	[3.27]	[1.25]	[0.20]	[1.36]	[1.02]
Recession	0.215	-0.005	-0.229	-0.115	0.167	-0.583	0.631
	[0.49]	[0.01]	[0.52]	[0.20]	[0.18]	[0.75]	[0.94]
Bank Crisis	-0.438	-0.289	-0.259	-1.916	-4.595	0.618	0.432
	[0.36]	[0.24]	[0.19]	[1.02]	[1.55]	[0.44]	[0.26]
Deposit Insurance	-0.239	-0.516	-0.121	0.426	0.274	-0.852	-0.550
	[0.57]	[1.15]	[0.31]	[0.73]	[0.28]	[1.31]	[0.88]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,163	2,940	2,352	1,485	778	1,167	1,214
Countries	165	152	130	85	46	59	75
R-Squared	0.5303	0.5726	0.5669	0.5937	0.6279	0.5737	0.5754

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

The coefficient for the interaction term of average reserve requirements and percentage changes in velocity turns out to be insignificant for all countries, but appears to be significantly positive at the 99 percent confidence level across all other models. This suggests that the velocity offsetting effect does not apply to CFA franc member states and low income countries. The substantial impact of the interaction effect becomes stronger when the sample is confined to richer countries, indicating that the velocity offsetting effect works better in advanced economies. Figure 3.5 shows the results of the interaction term on changes in M2 as a percentage of GDP for upper-middle income countries or higher. We can see that a percentage increase in velocity approximates a percentage decrease in M2/GDP if reserve requirements are non-existent, thus approaching a unit elastic offsetting effect. At higher reserve requirements, the magnitude of the velocity offsetting effect declines, and eventually becomes insignificant once average reserve requirements are above 30 percent.

Figure 3.5: Marginal effect of a percentage change in velocity on changes in M2/GDP conditional on reserve requirements based on Table 3.2, model 4.



Note: Dashed lines give 90 percent confidence interval.

How relevant are these findings for the inflation rate? Table 3.3 re-estimates the previous models with the inflation rate as dependent variable – with similar results: The coefficient of the interaction term appears to be significantly positive, and the significant level as well as the magnitude increase for subsamples of richer countries. Figure 3.6 shows that the inflation rate is only slightly above zero in response to a percentage increase in velocity, when reserve requirements are low. This inflation stability effect tends to disappear at higher reserve requirement levels. At reserve requirements of 30 percent or higher, the inflation rate is not significantly below one percent anymore, indicating that a percentage increase in velocity is completely reflected in a percentage increase in inflation.

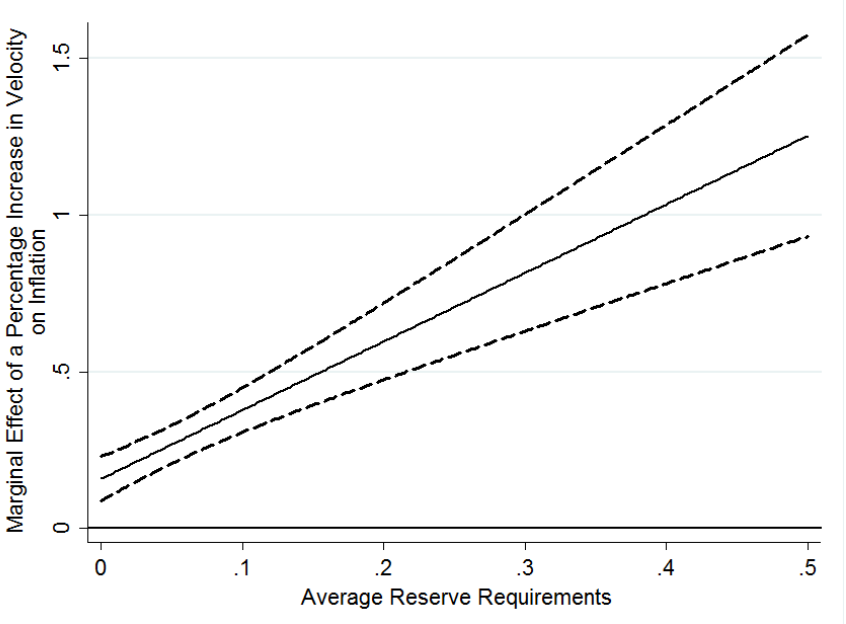
The empirical results appear to confirm the velocity offsetting effect of H1, and the inflation stability effect of H2: When reserve requirements are deregulated, the banking system tend to adjust the supply of inside money contrarily to changes in velocity. As a result, the inflation rate tend to be robust to changes in velocity. Banking systems with higher reserve requirements are significantly less able to offset changes in velocity, while changes in velocity have also a significantly higher influence on the inflation rate.

Table 3.3: GLS Prais-Winsten regression analyses to explain annual inflation rates

	1 All	2 No CFA franc	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Interaction Term Av. RR * Δ Velocity	0.967*** [2.75]	0.714** [2.12]	0.895** [2.45]	1.324*** [3.07]	2.380*** [5.06]	1.909*** [3.53]	1.639** [2.36]
Δ Velocity	0.244*** [3.84]	0.309*** [5.30]	0.251*** [4.35]	0.224*** [4.70]	0.139*** [3.65]	0.175*** [2.62]	0.124 [1.57]
Av. Reserve Requirements	6.506 [0.88]	4.939 [0.63]	5.177 [0.51]	12.446 [1.17]	-45.697** [2.53]	3.066 [0.18]	-3.198 [0.13]
Δ Monetary Base	0.059** [2.21]	0.053** [2.13]	0.118*** [6.34]	0.048*** [3.57]	0.009 [1.00]	0.079*** [3.82]	0.147*** [4.71]
GDP per Capita (log)	-8.488*** [2.77]	-8.491** [2.58]	-11.511*** [3.32]	-4.716* [1.91]	-0.920 [0.45]	-87.031* [1.87]	-7.511 [1.39]
M2/GDP	0.067*** [3.39]	0.071*** [3.50]	0.042** [2.47]	0.011 [0.86]	-0.031*** [4.30]	0.088*** [3.26]	0.056* [1.92]
Economic Growth	-0.384*** [4.08]	-0.502*** [5.08]	-0.489*** [4.35]	-0.254** [2.49]	-0.139 [1.39]	-0.812*** [3.40]	-0.618*** [3.33]
Recession	0.815 [0.95]	0.621 [0.69]	1.123 [1.30]	1.972** [2.55]	0.954 [1.41]	-0.553 [0.49]	-0.741 [0.57]
Bank Crisis	-2.874** [2.03]	-2.478* [1.78]	-2.548 [1.54]	-2.338* [1.68]	-2.879** [2.57]	-3.061* [1.90]	-3.016** [2.14]
Deposit Insurance	-7.481*** [4.17]	-7.629*** [3.99]	-4.784*** [2.72]	-2.483 [1.22]	-1.002 [1.02]	-7.735** [2.38]	-7.178* [1.86]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,233	3,010	2,416	1,521	799	1,197	1,246
Countries	165	152	130	85	46	59	75
R-Squared	0.4404	0.4468	0.4661	0.4595	0.5009	0.4567	0.4957

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

Figure 3.6: Marginal effect of a percentage change in velocity on the inflation rate conditional on reserve requirements based on Table 3.3, model 4.



Note: Dashed lines give 90 percent confidence interval.

3.4.4 Robustness test: Does central bank independence matter?

As discussed in the introduction, Friedman (2003) conjectures that the adoption of monetarist beliefs by central bankers led to stable inflation rates in an environment of unpredictable changes in velocity; the central bank literature finds a robust association between central bank independence and low inflation rates (e. g., Kydland and Prescott, 1977; Rogoff, 1985; Alesina and Summers, 1993; Cukierman, 2008; Klomp and de Haan, 2010a, 2010b). Although there is apparently no proposed mechanism that would explain why independent central bankers are particularly good in predicting velocity in a volatile environment, it is conceivable that it is not deregulated reserve requirements but central bank independence that explains monetary stability.

Table 3.4: GLS Prais-Winsten regression analyses to explain ΔM2/GDP with central bank independence as additional explanatory variable

	1 All	2 All	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Member	7 Cordella et al. Data
Central Bank Independence	1.313	2.472	1.172	-0.239	-3.035	-0.007	-1.860
	[0.97]	[1.54]	[1.00]	[0.15]	[1.34]	[0.01]	[1.00]
Interaction Term	-0.106	0.236	-0.129	-0.159	-0.982**	-0.203	-0.183
CBI * Δ Velocity	[0.59]	[1.14]	[0.68]	[0.71]	[2.33]	[0.89]	[0.78]
Interaction Term		0.859**	2.271***	2.322***	2.466**	2.122***	2.763***
Av. RR * Δ Velocity		[2.02]	[4.49]	[3.61]	[2.29]	[3.23]	[4.18]
Δ Velocity	-0.401***	-0.740***	-0.651***	-0.766***	-0.505**	-0.672***	-0.659***
	[3.76]	[5.09]	[5.06]	[4.78]	[2.07]	[4.12]	[4.33]
Av. Reserve Requirements		2.754	4.314	5.003	17.369	2.400	5.880
		[0.94]	[1.19]	[0.77]	[1.19]	[0.54]	[0.94]
Δ Monetary Base		0.008	-0.003	-0.009	-0.004	-0.005	0.003
		[0.67]	[0.57]	[1.31]	[0.35]	[0.81]	[0.46]
GDP per Capita (log)		0.914	1.301	3.504*	6.157	0.652	-0.765
		[0.66]	[0.91]	[1.69]	[1.23]	[0.31]	[0.40]
M2/GDP t-1		-0.035	-0.026	-0.010	0.007	-0.013	-0.066*
		[1.27]	[1.04]	[0.38]	[0.23]	[0.48]	[1.77]
Economic Growth		-0.030	-0.022	0.065	0.151	-0.022	-0.018
		[0.57]	[0.46]	[1.00]	[1.04]	[0.33]	[0.28]
Recession		0.289	0.656	0.866	1.376	0.587	0.833
		[0.40]	[0.91]	[0.95]	[0.93]	[0.62]	[0.84]
Bank Crisis		0.422	0.400	-0.738	-2.303	0.479	0.562
		[0.36]	[0.33]	[0.48]	[0.98]	[0.34]	[0.33]
Deposit Insurance		-1.791***	-1.412***	-0.030	0.177	-1.220*	-0.843
		[3.09]	[3.14]	[0.05]	[0.11]	[1.83]	[1.33]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,424	1,312	1,171	817	452	880	866
Countries	83	81	75	55	32	52	60
R-Squared	0.5621	0.5783	0.5847	0.6137	0.6767	0.5832	0.5904

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

The measurement for Central Bank Independence is obtained from Bodea and Hicks (2015). This dataset provides the largest coverage of annual data on central bank independence currently available with a coverage of up to 82 predominantly democratic countries until 2010. Given the size and time span of the reserve requirement dataset, however, this leads to a substantial drop of cases in the time-series analysis. An interaction term

between Central Bank Independence and changes in velocity evaluates whether the velocity offsetting effect for reserve requirements weakens or even vanishes at the presence of independent central banks.

Table 3.4 shows the regression analyses to explain changes in M2 as a percentage of GDP, and adds the Central Bank Independence variable and its interaction term. Both variables do not appear to be significant in all models, except for the interaction term for the subsamples of high-income countries. The negative significant coefficient of the interaction term suggests that there is a velocity offsetting effect, as the central bank becomes more independent. Yet, the significant velocity offsetting effect for low reserve requirements persists across all models.

Table 3.5: GLS Prais-Winsten regression analyses to explain annual inflation rates with central bank independence as additional explanatory variable

	1 All	2 All	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Central Bank Independence	-20.202**	-14.520*	-13.021*	-14.734**	-0.886	-26.123***	-24.485*
	[2.40]	[1.83]	[1.81]	[2.17]	[0.55]	[3.94]	[1.88]
Interaction Term CBI * Δ Velocity	-0.225	-0.335	-0.737***	-0.370**	-0.163**	-0.588**	-0.948***
	[0.96]	[1.07]	[2.60]	[2.20]	[2.21]	[2.20]	[3.03]
Interaction Term Av. RR * Δ Velocity		0.151	1.343**	2.239***	3.971***	1.813***	1.818***
		[0.26]	[2.30]	[4.41]	[4.71]	[3.04]	[2.69]
Δ Velocity	0.393**	0.507**	0.611***	0.293**	0.065	0.512**	0.668***
	[2.60]	[2.14]	[2.69]	[2.32]	[1.30]	[2.35]	[2.70]
Av. Reserve Requirements		0.710	9.567	18.952	14.712	-8.27	5.653
		[0.04]	[0.47]	[0.95]	[1.62]	[0.44]	[0.21]
Δ Monetary Base		0.041	0.179***	0.056***	-0.001	0.132***	0.139***
		[1.55]	[5.00]	[2.72]	[0.20]	[3.98]	[4.01]
GDP per Capita (log)		-8.978	-11.015**	-8.590	2.017	-7.159	-17.004**
		[1.45]	[2.00]	[1.54]	[0.62]	[1.02]	[2.06]
M2/GDP		0.127***	0.096***	0.042**	-0.022***	0.107***	0.053
		[3.60]	[3.50]	[2.21]	[2.82]	[3.32]	[1.57]
Economic Growth		-0.688***	-0.823***	-0.321*	-0.089	-0.877***	-0.670***
		[3.32]	[3.99]	[1.94]	[1.21]	[3.31]	[2.83]
Recession		0.648	-0.066	1.358	-0.141	-1.658	0.485
		[0.37]	[0.04]	[1.02]	[0.32]	[1.15]	[0.27]
Bank Crisis		-2.783	-3.296*	-1.408	-0.009	-4.045**	-3.755**
		[1.58]	[1.78]	[1.01]	[0.02]	[2.39]	[2.33]
Deposit Insurance		-6.119**	-3.715	-2.606	-0.955	-5.203	-2.469
		[2.20]	[1.59]	[0.79]	[0.87]	[1.46]	[0.60]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,424	1,348	1,201	840	469	907	886
Countries	83	81	75	55	32	52	60
R-Squared	0.4024	0.4634	0.5493	0.5030	0.5739	0.5315	0.5495

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

A similar picture emerges for reserve requirements in Table 3.5, in which the inflation rate is the dependent variable. The interaction term of reserve requirements and velocity remains significant in all subsamples except for model 2, while controlling for central bank independence. But the central bank independence coefficient appears to be significant as well in models 3-7, confirming the well-established link between central bank

independence and low inflation rates. The interaction term of central bank independence and velocity is also significantly negative except for model 2, indicating that the positive impact of an increase in velocity on inflation tends to vanish as central banks become more independent.

The results indeed suggest that independent central bankers are better equipped to offset changes in velocity in order to achieve stable inflation rates. The velocity offsetting effect of low reserve requirements for changes in M2/GDP and for the inflation rate appear to be robust to central bank independence. Thus, central bank independence as well as low reserve requirements are key for price stability.

3.5 Conclusion

"One of the most recent, and perhaps most important, innovations in central banking has been the elimination of reserve requirements" (Rochon and Rossi 2011: 98): Reserve requirements have become less important for central banks to manage the money supply. But this analysis reveals that reserve requirements are still important for monetary outcomes. The level of reserves holding by financial institutions responds contrarily to changes in the velocity of money if reserve requirements are low or non-existent: As velocity of money goes down (up), the optimal ratio of reserves holding of banks declines (increases). This, in turn, induces banks to increase (decrease) the money supply, and to foster price stability even when velocity becomes volatile.

Consequently, the deregulation of reserve requirements could answer *Friedman's Conundrum* on why the world has witnessed two apparently conflicting trends in monetary policy since the 1990s: Stable inflation rates while velocity simultaneously started to behave atypically.

The deregulation of reserve requirements allows for a decentralized decision-making process within the private banking system. The local profit-seeking decisions of depository institutions tend to produce an outcome on the macro-level that effectively offsets changes in aggregate velocity. Independent central banks or a conservative monetary policy are certainly a necessary condition for price stability as revealed by the empirical analysis. Central bank independence might also be an important intervening factor in the relationship between low reserve requirements and price stability, if independent central bankers have a stronger propensity to reduce reserve requirements. Yet, the empirical results show that central bank independence cannot sufficiently explain stable prices. The

money supply as well as inflation are robust to changes in velocity only if reserve requirements are low or abolished.

This study also has major implications for the third installment of the Basel Accords. The empirical results imply that imposing liquidity requirements could have adverse effects on monetary stability, particularly as the velocity offsetting and inflation stability effects were relatively robust in the subsample of BIS member states. After over two decades of relatively stable and low inflation in most advanced economies, volatility in monetary policy-making might return as an unintended consequence of Basel III.

References

Abiad, Abdul, Enrica Detragiache, and Thierry Tressel. 2008. *A new database of financial reforms*. Washington, DC: International Monetary Fund.

Agénor, Pierre-Richard, Joshua Aizenman, and Alexander W. Hoffmaister. 2004. "The credit crunch in East Asia: what can bank excess liquid assets tell us?." *Journal of International Money and Finance* 23(1): 27-49.

Agénor, Pierre-Richard, and Karim El Aynaoui. 2010. "Excess liquidity, bank pricing rules, and monetary policy." *Journal of Banking & Finance* 34(5): 923-933.

Alchian, Armen A., and William R. Allen. 1972. *University economics*. Wadsworth.

Alesina, Alberto, and Lawrence H. Summers. 1993. "Central bank independence and macroeconomic performance: some comparative evidence." *Journal of Money, Credit and Banking* 25(2): 151-162.

Baltensperger, Ernst. 1974. "The precautionary demand for reserves." *The American Economic Review* 64(1): 205-210.

Banque Centrale des États de l'Afrique de l'Ouest (BCEAO). 2012. *2012 Annual Report*. Dakar, Senegal: Central Bank of West African States.

Barth, James R., Gerard Caprio, and Ross Levine. 2005. *Rethinking bank regulation: Till angels govern*. Cambridge: Cambridge University Press.

Bech, Morten L., and Elizabeth Klee. 2011. "The mechanics of a graceful exit: Interest on reserves and segmentation in the federal funds market." *Journal of Monetary Economics* 58(5): 415-431.

Bennett, Paul, and Spence Hilton. 1997. "Falling reserve balances and the federal funds rate." *Current Issues in Economics and Finance* 3(5): 1-6.

Berentsen, Aleksander, Samuel Huber, and Alessandro Marchesiani. 2015. "Financial innovations, money demand, and the welfare cost of inflation." *Journal of Money, Credit and Banking* 47(S2): 223-261.

Bernanke, Ben S. 2007. "The Financial Accelerator and the Credit Channel." Speech given at the Credit Channel of Monetary Policy in the Twenty-first Century Conference, Federal Reserve Bank of Atlanta.

Bernanke, Ben S. 2009. "The Fed's exit strategy." *Wall Street Journal*, July 21.

Bernanke, Ben S., and Mark Gertler. 1995. "Inside the Black Box: The Credit Channel of Monetary Policy Transmission." *Journal of Economic Perspectives* 9(4): 27-48.

Bodea, Cristina, and Raymond Hicks. 2015. "Price stability and central bank independence: Discipline, credibility, and democratic institutions." *International Organization 69*(1), 35-61.

Brock, Philip L. 1989. "Reserve requirements and the inflation tax." *Journal of Money, Credit and Banking* 21(1): 106-121.

Calomiris, Charles W., Joseph Mason, and David Wheelock. 2011. "Did doubling reserve requirements cause the recession of 1937-1938? A microeconomic approach." NBER Working Paper No. 16688.

Carpenter, Seth B., and Selva Demiralp. 2012. "Money, reserves, and the transmission of monetary policy: Does the money multiplier exist?." *Journal of Macroeconomics* 34(1): 59-75.

Christiano, Lawrence J., Martin Eichenbaum, and Charles L. Evans. 1999. "Monetary policy shocks: What have we learned and to what end?." Pp. 65-148 in: Michael Woodford and John Taylor (eds.): *Handbook of Macroeconomics Vol 1*. Amsterdam: Elsevier.

Clinton, Kevin. 1997. "Implementation of monetary policy in a regime with zero reserve requirements." Bank of Canada working paper no. 97-8.

Clouse, James A., and Douglas W. Elmendorf. 1997. "Declining required reserves and the volatility of the federal funds rate." Working Paper, Division of Research and Statistics, Division of Monetary Affairs, Federal Reserve Board.

Cordella, Tito, Pablo Federico, Carlos Vegh, and Guillermo Vuletin. 2014. *Reserve requirements in the brave new macroprudential world*. Washington, DC: World Bank Publications.

Cukierman, Alex. 2008. "Central bank independence and monetary policymaking institutions – Past, present and future." *European Journal of Political Economy* 24(4): 722-736.

Demiralp, Selva, and Dennis Farley. 2005. "Declining required reserves, funds rate volatility, and open market operations." *Journal of Banking & Finance* 29(5): 1131-1152.

Demirgüç-Kunt, Asli, Edward Kane and Luc Laeven. 2013. "Deposit Insurance Database." World Bank Policy Research Working Paper #6934. Washington, DC: World Bank.

Diamond, Douglas W., and Raghuram G. Rajan. "Money in a Theory of Banking." *American Economic Review* 96(1): 30-53.

Disyatat, Piti. 2011. "The bank lending channel revisited." *Journal of Money, Credit and Banking* 43(4): 711-734.

Di Giorgio, Giorgio. 1999. "Financial development and reserve requirements." *Journal of Banking & Finance* 23(7): 1031-1041.

Dynan, Karen E., Douglas W. Elmendorf, and Daniel E. Sichel. 2006. "Can financial innovation help to explain the reduced volatility of economic activity?" *Journal of Monetary Economics* 53(1): 123-150.

Fama, Eugene F. 1980. "Banking in the Theory of Finance." *Journal of Monetary Economics* 6(1): 39-57.

Fama, Eugene F. 1983. "Financial intermediation and price level control." *Journal of Monetary Economics* 12(1): 7-28.

Feinman, Joshua N. 1993. "Reserve requirements: history, current practice, and potential reform." *Federal Reserve Bulletin* 79: 569-589.

Financial Stability Forum. 2008. *Report of the Financial Stability Forum on Enhancing Market and Institutional Resilience*. Basel: Financial Stability Board.

Friedman, Milton. 1956. "The Quantity Theory of Money: A Restatement." In: Milton Friedman (ed.): *Studies in the Quantity Theory of Money*. Chicago: University of Chicago Press.

Friedman, Milton. 2003. "The Fed's Thermostat." *Wall Street Journal*, August 19.

Friedman, Milton, and Anna Jacobson Schwartz. 1963. *A monetary history of the United States, 1867-1960*. Princeton: Princeton University Press.

Glocker, Christian and Pascal Towbin. 2012. "The macroeconomic effects of reserve Requirements." Banque de France, WIFO Working Paper No. 420.

Gray, Simon. 2011. *Central bank balances and reserve requirements.* Washington, DC: International Monetary Fund.

Greenspan, Alan. 1992. "Letter written to the Honorable Stephen L. Neal." House of Representatives. March 6.

Hardy, Daniel CL. 1997. "Reserve Requirements and Monetary Management: An Introduction." Pp 41-93 in: Tomás JT Baliño and Lorena M. Zamalloa (eds.): *Instruments of monetary management: issues and country experiences.* Washington, DC: International Monetary Fund.

Henderson, David R., and Jeffrey Rogers Hummel. 2008. "Greenspan's Monetary Policy in Retrospect." *Cato Institute Briefing Papers* 109.

Hummel, Jeffrey Rogers. 2010. "Government's Diminishing Benefits from Inflation." *The Freeman* 60: 25-29.

Ireland, Peter. 2009. "On the Welfare Cost of Inflation and the Recent Behavior of Money Demand." *American Economic Review* 99: 1040-52.

Kashyap, Anil K., and Jeremy C. Stein. 2012. "The Optimal Conduct of Monetary Policy with Interest on Reserves." *American Economic Journal: Macroeconomics* 4(1): 266-282.

Khemraj, Tarron. 2010. "What does excess bank liquidity say about the loan market in Less Developed Countries?." *Oxford Economic Papers* 62(1): 86-113.

Klomp, Jeroen, and Jakob de Haan. 2010a. "Central bank independence and inflation revisited." *Public Choice* 144(3-4): 445-457.

Klomp, Jeroen, and Jakob de Haan. 2010b. "Inflation and Central Bank Independence: A Meta-Regression Analysis." *Journal of Economic Surveys* 24(4): 593-621.

Kydland, Finn, and Edward Prescott. 1977. "Rules Rather Than Discretion: The Inconsistency of Optimal Plans." *Journal of Political Economy* 85(3): 473-92.

Kireyev, Alexei. 2015. "How to Improve the Effectiveness of Monetary Policy in the West African Economic and Monetary Union." IMF Working Paper No. 15-99.

Laeven, Luc, and Fabian Valencia. 2008. "Systemic Banking Crises: A New Database." IMF Working Paper WP/08/224.

Laeven, Luc, and Fabian Valencia. 2012. "Systemic Banking Crises Database: An Update." IMF Working Paper WP/12/163.

Loungani, Prakash, and Mark Rush. 1995. "The effect of changes in reserve requirements on investment and GNP." *Journal of Money, Credit and Banking* 27(2): 511-526.

Lown, Cara S., and John H. Wood. 2003 "The determination of commercial bank reserve requirements." *Review of Financial Economics* 12(1): 83-98.

Lucas, Robert E., and Juan Pablo Nicolini. 2015. "On the stability of money demand." *Journal of Monetary Economics 73: 48-65.*

McLeay, Michael, Amar Radia, and Ryland Thomas. 2014. "Money creation in the modern economy." Pp. 14-27 in: Bank of England: *Quarterly Bulletin: Q1*. London: Bank of England.

Meltzer, Allan H. 1963. "The demand for money: the evidence from the time series." *The Journal of Political Economy* 71(3): 219-246.

Nautz, Dieter, and Sandra Schmidt. 2009. "Monetary policy implementation and the federal funds rate." *Journal of Banking & Finance* 33(7): 1274-1284.

Olivera, Julio HG. 1971. "The Square-Root Law of Precautionary Reserves." *Journal of Political Economy* 79(5): 1095-1104.

Park, Haelim, and Patrick Van Horn. 2015. "Did the Reserve Requirement Increases of 1936-1937 Reduce Bank Lending? Evidence from a Quasi-Experiment." *Journal of Money, Credit and Banking* 47(5): 791-818.

Patinkin, Don. 1956. *Money, Interest and Prices: An Integration of Monetary and Value Theory*. Evanston: Row, Peterson and Company.

Plümper, Thomas, Vera E. Troeger, and Philip Manow. 2005. "Panel data analysis in comparative politics: Linking method to theory." *European Journal of Political Research* 44(2): 327-354.

Reinhart, Carmen M., and Vincent Reinhart. 1999. "On the use of reserve requirements in dealing with capital flow problems." *International Journal of Finance and Economics* (1): 27-54.

Reinhart, Carmen M., and Vincent R. Reinhart. "Capital inflows and reserve accumulation: The recent evidence." NBER Working Paper No. 13842.

Rochon, Louis-Philippe, and Sergio Rossi. 2011. "Monetary Policy Without Reserve Requirements: Central Bank Money as Means of Final Payment on the Interbank Market." Pp 98-115 in: Claude Gnos and Louis-Philippe Rochon (eds.): *Credit, money and macroeconomic policy: a post-Keynesian approach*. London: Edward Elgar Publishing.

Rogoff, Kenneth. 1985. "The optimal degree of commitment to an intermediate monetary target." *Quarterly Journal of Economics* 100(4): 1169-1189.

Saxegaard, Magnus. 2006. *Excess liquidity and effectiveness of monetary policy: evidence from sub-Saharan Africa.* Washington, DC: International Monetary Fund

Sechrest, Larry J. 2008. *Free Banking. Theory, History, and a Laissez-Faire Model*. Auburn: Ludwig von Mises Institute.

Selgin, George. 1988. *Theory of Free Banking: Money Supply Under Competitive Note Issue*. Totowa, NJ: Rowman & Littlefield.

Selgin, George. 2001. "In-concert overexpansion and the precautionary demand for bank reserves." *Journal of Money, Credit and Banking* 33(2): 294-300.

Selgin, George. 2002. *Bank deregulation and monetary order.* London: Routledge.

Sellon, Gordon H., and Stuart E. Weiner. 1996. "Monetary Policy Without Reserve Requirements: Analytical Issues." *Federal Reserve Bank of Kansas City Economic Review* 81(4): 5-24.

Shim, Ilhyock, Bilyana Bogdanova, Jimmy Shek, and Agne Subeltye. 2013. "Database for policy actions on housing markets." *BIS Quarterly Review* 18(3): 83-95.

Teles, Pedro, and Ruilin Zhou. 2005. "A Stable Money Demand: Looking for the Right Monetary Aggregate." *Federal Reserve Bank of Chicago Economic Perspectives* 29(1): 50–63.

Terrier, Gilbert, Rodrigo Valdés, Camilo E. Tovar, Jorge Chan-Lau, Carlos Fernández-Valdovinos, Mercedes García-Escribano, Carlos Medeiros, Man-Keung Tang, Mercedes Vera Martin, and Chris Walker. 2011. *Policy instruments to lean against the wind in Latin America.* Washington, DC: International Monetary Fund.

Tetlock, Philip. 2005. *Expert political judgment: How good is it? How can we know?* Princeton: Princeton University Press.

Tovar, Camilo Ernesto, Mercedes Garcia-Escribano, and Mercedes Vera-Martín. 2012. *Credit growth and the effectiveness of reserve requirements and other macroprudential instruments in Latin America.* Washington, DC: International Monetary Fund.

VanHoose, David D., and David B. Humphrey. 2001. "Sweep accounts, reserve management, and interest rate volatility." *Journal of Economics and Business* 53(4): 387-404.

Weiner, Stuart E. 1992. "The changing role of reserve requirements in monetary policy." *Economic Review-Federal Reserve Bank of Kansas* City 77: 45-45.

White, Lawrence H. 1999. *The Theory of Monetary Institutions.* Malden, MA: Blackwell.

Woodford, Michael. 2002. "Financial market efficiency and the effectiveness of monetary policy." *Economic Policy Review* 8(1): 85-94.

Appendix: Additional tables

Table 3.6: Countries and periods covered by the reserve requirements dataset

	Country	Period
1	Afghanistan	2005-2013
2	Albania	1992-2013
3	Algeria	1994-2013
4	Angola	1992; 2000-2013
5	Antigua and Barbuda	1990-2013
6	Argentina	1990-2013
7	Armenia	1994-2013
8	Aruba	1992-2013
9	Australia	1990-2013
10	Austria	1990-2013
11	Azerbaijan	1992-2013
12	Bahamas	1990-2013
13	Bahrain	1990-2013
14	Bangladesh	1991-2013
15	Barbados	1990-2013
16	Belarus	1992-2013
17	Belgium	1990-2013
18	Belize	1990-2013
19	Benin	1993-2013
20	Bhutan	1990-2013
21	Bolivia	1990-2013
22	Bosnia and Herzegovina	1997-2013
23	Botswana	1994-2013
24	Brazil	1990-2013
25	Bulgaria	1990-2013
26	Burkina Faso	1993-2013
27	Cambodia	1992-2013
28	Cameroon	2001-2013
29	Canada	1990-2013
30	Cape Verde	1998-2013
31	Chad	2002-2013
32	Chile	1990-2013
33	China	1990-2013
34	Colombia	1990-2013
35	Comoros	2002-2013
36	Congo, Rep.	2001-2013
37	Costa Rica	1990-2013
38	Croatia	1993-2013
39	Cyprus	1999-2013
40	Czech Republic	1990-2013
41	Denmark	1990-2013

42	Dominica	1990-2013
43	Dominican Republic	1990-2013
44	Ecuador	1990-2013
45	Egypt, Arab Rep.	1990-2013
46	El Salvador	1994-2013
47	Equatorial Guinea	2005-2013
48	Estonia	1992-2013
49	Fiji	1990-2013
50	Finland	1990-2013
51	France	1990-2013
52	Gabon	2001-2013
53	Gambia	1999-2013
54	Georgia	1992-2013
55	Germany	1990-2013
56	Ghana	1997-2013
57	Greece	1990-2013
58	Grenada	1990-2013
59	Guatemala	1991-2013
60	Guinea-Bissau	1998-2013
61	Guyana	1990-2013
62	Haiti	1993-2013
63	Honduras	1996-2013
64	Hong Kong SAR, China	1990-2013
65	Hungary	1994-2013
66	Iceland	1990-2013
67	India	1990-2013
68	Indonesia	1990-2013
69	Iraq	2004-2013
70	Ireland	1990-2013
71	Israel	1990-2013
72	Italy	1990-2013
73	Ivory Coast	1993-2013
74	Jamaica	1990-2013
75	Japan	1990-2013
76	Jordan	1990-2013
77	Kazakhstan	1995-2013
78	Kenya	1990-2013
79	Korea Republic	1990-2013
80	Kosovo	2001-2013
81	Kuwait	1999-2013
82	Kyrgyz Republic	1993-2013
83	Lao PDR	1990-2013
84	Latvia	1993-2013
85	Lebanon	1995-2013
86	Lesotho	1999-2013
87	Liberia	1999-2002; 2005-2013

88	Lithuania	1990-2013
89	Luxembourg	1990-2013
90	Macao SAR, China	1990-2013
91	Macedonia	2004-2013
92	Madagascar	1999-2013
93	Malawi	1990-2013
94	Malaysia	1990-2013
95	Maldives	1990-2013
96	Mali	1993-2013
97	Malta	1990-2013
98	Mauritius	1991-2013
99	Mexico	1990-2013
100	Moldova	2004-2013
101	Mongolia	1996-2013
102	Montenegro	2002-2013
103	Morocco	1992-2013
104	Mozambique	2001-2013
105	Namibia	1990-2013
106	Nepal	1991-2013
107	Netherlands	1990-2013
108	New Zealand	1990-2013
109	Nicaragua	1993-2013
110	Niger	1993-2013
111	Nigeria	1990-2013
112	Norway	1990-2013
113	Oman	1990-2013
114	Pakistan	1990-2013
115	Panama	1990-2013
116	Papua New Guinea	1997-2013
117	Paraguay	1990-2013
118	Peru	1990-2013
119	Philippines	1990-2013
120	Poland	1990-2013
121	Portugal	1990-2013
122	Qatar	1990-2013
123	Romania	1992-2013
124	Russian Federation	1991-2013
125	Samoa	1990-2013
126	Sao Tome and Principe	1996-2013
127	Saudi Arabia	1990-2013
128	Senegal	1993-2013
129	Serbia	2005-2013
130	Seychelles	1990-2013
131	Singapore	1990-2013
132	Slovak Republic	1993-2013
133	Slovenia	1991-2013
134	Solomon Islands	1990-2013

135	South Africa	1990-2013
136	Spain	1990-2013
137	Sri Lanka	1990-2013
138	St. Kitts and Nevis	1990-2013
139	St. Lucia	1990-2013
140	St. Vincent and the Grenadines	1990-2013
141	Sudan	1990-2013
142	Suriname	2001-2013
143	Swaziland	1990-2013
144	Sweden	1990-2013
145	Switzerland	1990-2013
146	Taiwan	1990-2013
147	Tajikistan	1997-2007
148	Tanzania	1993-2013
149	Thailand	1990-2013
150	Timor-Leste	2001-2013
151	Togo	1993-2013
152	Tonga	1993-2013
153	Trinidad and Tobago	1990-2013
154	Tunisia	1990-2013
155	Turkey	1990-2013
156	Uganda	1990-2013
157	Ukraine	1992-2013
158	United Arab Emirates	1990-2013
159	United Kingdom	1990-2013
160	United States	1990-2013
161	Uruguay	1990-2013
162	Uzbekistan	1994-2013
163	Vanuatu	1990-2013
164	Venezuela	1990-2013
165	Vietnam	1995-2013
166	Yemen	1995-2013
167	Zambia	2004-2013
168	Zimbabwe	2001-2013

Table 3.7: GLS Prais-Winsten regression analyses to explain ΔM2/GDP with reserve requirements measured as domestic average without including liquidity requirements

	1 All	2 No CFA franc	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Interaction Term	0.164	0.545	1.950***	2.128***	4.025***	2.236***	2.579***
Av. Dom RR * Δ Velocity	[0.42]	[1.43]	[5.60]	[4.45]	[4.52]	[3.39]	[4.93]
Δ Velocity	-0.407***	-0.504***	-0.675***	-0.804***	-1.010***	-0.783***	-0.739***
	[7.48]	[11.91]	[14.86]	[14.23]	[12.93]	[11.62]	[11.74]
Av. Domestic Reserve Requirements	0.588	2.839	3.616	2.695	-12.784	5.264	-5.169
	[0.35]	[1.56]	[1.47]	[0.55]	[1.06]	[1.35]	[1.15]
Δ Monetary Base	0.006	0.009	0.003	0.003	0.003	-0.005	-0.007
	[0.63]	[0.87]	[0.64]	[0.61]	[0.40]	[0.90]	[1.02]
GDP per Capita (log)	1.834***	1.706**	1.156	1.888	0.488	1.340	-1.985
	[2.61]	[2.30]	[1.36]	[1.59]	[0.31]	[1.17]	[1.39]
M2/GDP t-1	-0.041**	-0.035**	-0.028*	-0.017	-0.007	-0.013	0.139***
	[2.40]	[2.18]	[1.77]	[1.01]	[0.31]	[0.58]	[4.28]
Economic Growth	-0.058	-0.075**	-0.103***	-0.059	-0.006	-0.041	0.051
	[1.49]	[2.03]	[2.83]	[1.10]	[0.07]	[0.67]	[0.97]
Recession	0.276	0.174	-0.147	-0.152	0.093	-0.326	0.242
	[0.64]	[0.40]	[0.34]	[0.27]	[0.10]	[0.42]	[0.38]
Bank Crisis	-0.493	-0.441	0.021	-1.794	-4.589	0.687	-0.675
	[0.40]	[0.36]	[0.02]	[0.99]	[1.58]	[0.49]	[0.37]
Deposit Insurance	-0.206	-0.456	-0.283	0.088	0.132	-0.846	-0.117
	[0.52]	[1.08]	[0.79]	[0.16]	[0.15]	[1.35]	[0.20]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,163	2,940	2,362	1,485	778	1,167	1,246
Countries	165	152	130	85	46	59	75
R-Squared	0.5274	0.5619	0.5866	0.6106	0.6412	0.5737	0.6345

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

Table 3.8: GLS Prais-Winsten regression analyses to explain annual inflation rates with reserve requirements measured as domestic average without including liquidity requirements

	1 All	2 No CFA franc	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Interaction Term	0.617	0.225	1.360**	2.610***	4.535***	2.539***	1.738**
Av. Dom RR * Δ Velocity	[1.24]	[0.48]	[2.47]	[5.43]	[7.83]	[4.14]	[2.25]
Δ Velocity	0.315***	0.396***	0.220***	0.145***	0.067**	0.142**	0.117
	[4.37]	[6.24]	[3.75]	[3.44]	[2.17]	[2.24]	[1.49]
Av. Domestic Reserve Requirements	30.181***	30.152**	36.454**	50.054**	8.814	34.563*	23.712
	[2.80]	[2.59]	[2.59]	[2.02]	[0.80]	[1.74]	[1.04]
Δ Monetary Base	0.058**	0.050*	0.117***	0.047***	0.013	0.079***	0.141***
	[2.10]	[1.96]	[6.36]	[3.77]	[1.44]	[3.86]	[4.66]
GDP per Capita (log)	-8.611***	-8.885***	-11.195***	3.796	-0.225	-7.255**	-7.756
	[2.86]	[2.73]	[3.26]	[1.40]	[0.13]	[2.01]	[1.47]
M2/GDP	0.069***	0.075***	-0.040**	0.008	-0.029***	0.082***	0.053*
	[3.57]	[3.79]	[2.44]	[0.61]	[4.19]	[3.16]	[1.87]
Economic Growth	-0.381***	-0.502***	-0.466***	-0.270***	-0.158	-0.757***	-0.617***
	[4.13]	[5.28]	[4.20]	[2.84]	[1.61]	[3.20]	[3.29]
Recession	1.053	0.781	1.336	1.965**	0.980	-0.150	-0.871
	[1.19]	[0.87]	[1.54]	[2.56]	[1.52]	[0.13]	[0.66]
Bank Crisis	-3.074**	-2.653*	-2.180	-1.789	-2.509**	-2.859*	-2.789**
	[2.08]	[1.83]	[1.32]	[1.28]	[2.54]	[1.77]	[2.00]
Deposit Insurance	-7.227***	-7.324***	-4.724***	-2.633	-1.207	-7.716**	-7.106*
	[4.09]	[3.89]	[2.69]	[1.42]	[1.33]	[2.39]	[1.83]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,233	3,010	2,416	1,521	799	1,197	1,246
Countries	165	152	130	85	46	59	75
R-Squared	0.4372	0.4456	0.4725	0.4867	0.5577	0.4712	0.4973

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

Table 3.9: GLS Prais-Winsten regression analyses to explain ΔM2/GDP based on reserve requirements for domestic demand deposits

	1 All	2 No CFA franc	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Interaction Term	-0.100	0.103	1.186***	1.106***	3.869***	1.037**	1.271***
Av. Dom RR * Δ Velocity	[0.36]	[0.36]	[3.14]	[2.92]	[5.07]	[2.53]	[2.65]
Δ Velocity	-0.374***	-0.449***	-0.617***	-0.745***	-1.034***	-0.716***	-0.633***
	[8.14]	[11.82]	[12.31]	[14.01]	[12.86]	[11.71]	[9.60]
Av. Domestic Reserve Requirements	0.778	2.146	1.184	-0.486	-7.271	0.676	-1.139
	[0.53]	[1.44]	[0.39]	[0.12]	[0.85]	[0.20]	[0.26]
Δ Monetary Base	0.004	0.006	0.001	0.002	0.004	-0.006	-0.009
	[0.48]	[0.64]	[0.34]	[0.42]	[0.56]	[1.04]	[1.25]
GDP per Capita (log)	1.731**	1.653**	1.198	1.895	0.791	1.498	-1.617
	[2.45]	[2.21]	[1.36]	[1.55]	[0.51]	[1.30]	[1.14]
M2/GDP t-1	-0.041**	-0.037**	-0.030*	-0.019	-0.006	-0.016	0.147***
	[2.44]	[2.24]	[1.86]	[1.07]	[0.26]	[0.69]	[4.28]
Economic Growth	-0.061*	-0.077**	-0.108***	-0.054	-0.018	-0.045	0.047
	[1.67]	[2.17]	[2.92]	[0.98]	[0.20]	[0.74]	[0.85]
Recession	0.275	0.189	-0.128	-0.094	0.039	-0.180	0.426
	[0.64]	[0.43]	[0.29]	[0.16]	[0.04]	[0.23]	[0.64]
Bank Crisis	-0.508	-0.435	0.015	-1.754	-4.519	0.862	-0.742
	[0.41]	[0.35]	[0.01]	[0.94]	[1.55]	[0.60]	[0.39]
Deposit Insurance	-0.112	-0.337	-0.233	0.172	0.113	-0.788	0.168
	[0.30]	[0.85]	[0.64]	[0.31]	[0.13]	[1.21]	[0.28]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,163	2,940	2,362	1,485	778	1,167	1,246
Countries	165	152	130	85	46	59	75
R-Squared	0.5271	0.5547	0.5722	0.5976	0.6430	0.5569	0.6068

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

Table 3.10: GLS Prais-Winsten regression analyses to explain annual inflation rates based on reserve requirements for domestic demand deposits

	1 All	2 No CFA franc	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Interaction Term	0.243	-0.013	1.211***	1.807***	4.055***	1.828***	1.515***
Av. Dom RR * Δ Velocity	[0.66]	[0.04]	[3.43]	[5.75]	[7.93]	[4.93]	[4.05]
Δ Velocity	0.350***	0.424***	0.213***	0.172***	0.054	0.156***	0.108
	[5.09]	[6.98]	[4.23]	[4.06]	[1.64]	[2.64]	[1.62]
Av. Domestic Reserve Requirements	40.940***	41.965***	43.997***	54.535**	8.955	42.004*	27.639
	[2.93]	[2.73]	[2.86]	[2.20]	[0.74]	[1.78]	[1.29]
Δ Monetary Base	0.056**	0.049**	0.113***	0.043***	0.013	0.073***	0.135***
	[2.05]	[1.94]	[6.34]	[3.80]	[1.40]	[3.75]	[4.62]
GDP per Capita (log)	-8.704***	-9.141***	-10.898***	-2.955	0.019	-7.418**	-7.797
	[2.89]	[2.81]	[3.20]	[1.10]	[0.01]	[2.09]	[1.46]
M2/GDP	0.066***	0.071***	-0.035**	0.003	-0.030***	0.078***	0.050*
	[3.46]	[3.62]	[2.10]	[0.22]	[4.16]	[2.98]	[1.82]
Economic Growth	-0.382***	-0.506***	-0.468***	-0.289***	-0.184*	-0.772***	-0.623***
	[4.17]	[5.44]	[4.27]	[3.16]	[1.74]	[3.40]	[3.43]
Recession	1.115	0.816	1.419	2.032***	0.883	-0.084	-0.820
	[1.25]	[0.91]	[1.64]	[2.62]	[1.29]	[0.08]	[0.62]
Bank Crisis	-3.016**	-2.613*	-1.953	-1.747	-2.441**	-2.557*	-2.437*
	[2.06]	[1.82]	[1.20]	[1.32]	[2.34]	[1.66]	[1.76]
Deposit Insurance	-6.948***	-6.991***	-4.566***	-2.018	-1.383	-7.442**	-7.062*
	[4.03]	[3.82]	[2.66]	[1.40]	[1.47]	[2.41]	[1.88]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	3,233	3,010	2,416	1,521	799	1,197	1,246
Countries	165	152	130	85	46	59	75
R-Squared	0.4403	0.4505	0.4828	0.5092	0.5474	0.4885	0.5077

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

Table 3.11: Arellano-Bond estimation to explain ΔM2/GDP

	1 All	2 No CFA franc	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Interaction Term	0.130	0.379	1.114***	1.158**	2.097**	1.649***	2.045***
Av. RR * Δ Velocity	[0.38]	[1.00]	[2.71]	[2.15]	[2.49]	[3.07]	[3.22]
Δ Velocity	-0.294***	-0.359***	-0.541***	-0.703***	-0.939***	-0.729***	-0.662***
	[4.12]	[4.26]	[6.77]	[7.13]	[7.28]	[6.49]	[5.44]
Av. Reserve Require-	3.132	3.969	1.543	0.185	-22.419	8.060	11.954
ments	[0.44]	[0.44]	[0.17]	[0.02]	[0.57]	[0.83]	[0.83]
Δ Monetary Base	0.010	0.011	-0.006	-0.006	0.000	-0.012*	-0.033***
	[1.50]	[1.41]	[1.10]	[1.10]	[0.01]	[1.84]	[3.64]
GDP per Capita (log)	6.137	5.969	5.376	5.330	-3.375	-0.961	-9.545
	[1.19]	[0.44]	[1.01]	[0.73]	[0.56]	[0.23]	[1.41]
M2/GDP t-1	-0.356**	-0.337***	-0.271***	-0.190***	-0.109***	-0.129***	-0.274***
	[5.89]	[5.59]	[7.12]	[6.09]	[5.05]	[4.19]	[4.53]
Economic Growth	-0.148***	-0.172***	-0.132**	-0.076	-0.030	-0.006	0.007
	[3.28]	[3.41]	[2.29]	[1.12]	[0.24]	[0.07]	[0.08]
Recession	-0.098	-0.185	-0.399	-0.587	-0.132	-0.823	0.736
	[0.17]	[0.29]	[0.73]	[0.83]	[0.14]	[0.95]	[0.83]
Bank Crisis	-0.114	0.084	-1.204	-1.852	-4.454	-0.486	0.007
	[0.10]	[0.07]	[0.95]	[1.01]	[1.40]	[0.28]	[0.00]
Deposit Insurance	-0.093	-0.603	0.157	-1.852	-0.568	-2.542	-0.531
	[0.06]	[0.32]	[0.17]	[1.01]	[0.31]	[1.63]	[0.40]
Lagged Dependent	0.045	0.043	0.070***	0.075***	0.102***	0.085***	0.104***
Variable	[1.43]	[1.40]	[2.68]	[3.01]	[5.06]	[3.58]	[5.32]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,967	2,757	2,229	1,405	727	1,089	1,126
Countries	165	152	130	85	46	59	74

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute z-values in brackets.

Table 3.12: Arellano-Bond estimation to explain annual inflation rates

	1 All	2 No CFA franc	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Interaction Term Av. RR * Δ Velocity	5.433** [2.17]	3.762* [1.77]	4.174*** [2.83]	6.417** [2.42]	2.230*** [3.12]	8.658*** [3.76]	7.982*** [4.27]
Δ Velocity	1.691* [1.84]	2.103* [1.84]	0.547** [2.39]	0.226 [0.88]	0.176** [2.52]	0.198 [0.83]	-0.004 [0.01]
Av. Reserve Requirements	-56.170 [1.28]	-66.303 [1.49]	-34.451 [1.46]	-28.933 [1.52]	-1.1334 [0.03]	-4.308 [0.15]	-12.548 [0.32]
Δ Monetary Base	0.755*** [3.44]	0.745*** [3.39]	0.832*** [8.48]	0.812*** [6.59]	0.009 [1.05]	0.845*** [10.36]	0.824*** [11.35]
GDP per Capita (log)	-14.905 [0.46]	-10.441 [0.29]	6.197 [0.59]	13.306* [1.71]	6.962** [2.46]	3.318 [0.40]	13.279 [1.52]
M2/GDP	0.977 [1.48]	1.057 [1.49]	0.202* [1.96]	-0.000 [0.00]	-0.027 [1.58]	0.122 [1.64]	0.028 [0.33]
Economic Growth	-1.280*** [3.47]	-1.236*** [3.53]	-1.194*** [5.30]	-0.879*** [3.50]	-0.249** [2.35]	-1.986*** [4.14]	-1.391*** [3.40]
Recession	-7.580 [1.21]	-8.292 [1.20]	-1.399 [0.55]	-0.165 [0.05]	1.172 [1.60]	-8.708** [2.11]	-4.508 [1.63]
Bank Crisis	30.048* [1.70]	28.121* [1.72]	2.188 [0.40]	2.308 [0.39]	-3.258** [2.34]	-4.401 [0.84]	0.014 [0.00]
Deposit Insurance	-6.949 [0.38]	-7.102 [0.33]	-14.15*** [2.96]	-9.486 [1.59]	0.521 [0.34]	-5.882 [0.71]	-20.72*** [2.66]
Lagged Dependent Variable	-0.000 [0.01]	-0.000 [0.02]	0.037*** [3.05]	0.041 [1.17]	-0.060 [0.95]	0.012** [2.23]	0.041 [1.07]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2,992	2,782	2,248	1,416	736	1,105	1,140
Countries	165	152	130	85	46	59	74

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute z-values in brackets.

Table 3.13: Arellano-Bond estimation to explain ΔM2/GDP with central bank independence as additional explanatory variable

	1 All	2 All	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Member	7 Cordella et al. Data
Central Bank Independence	-2.462 [0.76]	-1.995 [0.49]	0.482 [0.18]	-2.882 [0.70]	-2.061 [0.50]	0.170 [0.04]	6.497 [1.05]
Interaction Term **CBI * Δ Velocity**	-0.324 [1.57]	-0.410*** [2.72]	-0.055 [0.26]	-0.019 [0.06]	-0.653 [1.06]	0.223 [0.73]	0.031 [0.12]
Interaction Term **Av. RR * Δ Velocity**		-0.117 [0.22]	1.738*** [3.26]	2.028*** [3.22]	2.456** [2.11]	1.846*** [3.78]	2.202*** [3.46]
Δ Velocity	-0.172 [1.33]	-0.049 [0.42]	-0.525*** [3.46]	-0.740*** [3.90]	-0.614* [1.95]	-0.834*** [4.06]	-0.687*** [3.86]
Av. Reserve Requirements		22.607* [1.67]	7.472 [0.61]	18.964 [1.20]	24.332 [0.66]	-3.393 [0.26]	16.928 [1.17]
Δ Monetary Base		0.006 [0.90]	-0.018*** [2.71]	-0.019** [2.07]	0.002 [0.20]	-0.012* [1.95]	-0.036*** [3.40]
GDP per Capita (log)		0.257 [0.05]	-4.171 [0.92]	-9.227 [1.52]	0.925 [0.09]	-4.381 [0.96]	-19.109*** [3.15]
M2/GDP t-1		-0.450*** [5.13]	-0.340*** [7.12]	-0.010 [0.38]	-0.134*** [2.72]	-0.219*** [5.43]	-0.304*** [6.14]
Economic Growth		-0.054 [0.60]	-0.026 [0.37]	0.170* [1.67]	0.252 [0.95]	0.070 [0.65]	0.100 [0.80]
Recession		1.521 [1.42]	0.670 [0.73]	0.719 [0.53]	1.180 [0.53]	0.926 [0.66]	0.666 [0.43]
Bank Crisis		-0.210 [0.20]	-0.743 [0.65]	-0.819 [0.52]	-2.354 [0.95]	-0.926 [0.54]	-0.186 [0.11]
Deposit Insurance		-3.547 [1.36]	-1.786 [1.61]	-2.555 [1.41]	-3.054 [1.41]	-3.996** [2.57]	-1.689 [1.01]
Lagged Dependent Variable	-0.021 [0.69]	0.071*** [2.64]	0.083*** [3.93]	0.067*** [3.36]	0.044* [1.77]	0.069*** [5.19]	0.089*** [4.67]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,284	1,213	1,088	757	412	811	793
Countries	83	81	75	55	32	52	59

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute z-values in brackets.

Table 3.14: Arellano-Bond estimation to explain annual inflation rates with central bank independence as additional explanatory variable

	1 All	2 All	3 > 1,045 USD	4 > 4,125 USD	5 > 12,735 USD	6 BIS Members	7 Cordella et al. Data
Central Bank Independence	-87.230	-17.822	-1.618	-14.574	-0.886	-20.54**	47.290
	[0.98]	[0.49]	[0.06]	[1.46]	[0.30]	[1.67]	[1.41]
Interaction Term	-6.170	-5.837	-1.095	-1.159**	-0.181	-0.667	-0.228
CBI * Δ Velocity	[1.22]	[1.35]	[1.57]	[2.23]	[1.46]	[1.00]	[0.25]
Interaction Term		5.423	3.811**	7.577***	4.581***	5.757***	7.362***
Av. RR * Δ Velocity		[0.83]	[2.30]	[4.76]	[3.87]	[3.24]	[3.42]
Δ Velocity	6.622*	4.980	1.246***	0.735**	0.072	0.723*	0.229
	[1.91]	[1.33]	[3.32]	[2.11]	[0.75]	[1.89]	[0.54]
Av. Reserve Requirements		-60.528	-44.565	-24.267	19.593	-79.94***	-30.002
		[1.08]	[1.62]	[0.97]	[0.70]	[3.57]	[0.73]
Δ Monetary Base		0.700***	0.917***	0.874***	0.007*	0.914***	0.840***
		[3.17]	[18.04]	[11.00]	[1.65]	[16.57]	[11.14]
GDP per Capita (log)		12.232	19.199**	17.477*	-2.308	12.700	11.827*
		[0.20]	[2.35]	[1.75]	[0.62]	[1.03]	[1.66]
M2/GDP		0.948	0.282**	0.027	-0.024***	0.180**	0.059
		[1.26]	[2.56]	[0.44]	[3.05]	[1.99]	[0.72]
Economic Growth		0.418	-1.734***	-1.409***	-0.054	-1.730***	-1.724***
		[0.34]	[4.78]	[3.91]	[0.54]	[3.78]	[3.57]
Recession		-9.854	-5.666	-5.779	-0.002	-8.768**	-4.548
		[1.01]	[1.55]	[1.41]	[0.00]	[1.98]	[1.08]
Bank Crisis		14.854	-2.608	-2.853	0.122	-9.197*	0.399
		[1.38]	[0.54]	[0.59]	[0.31]	[1.96]	[0.08]
Deposit Insurance		-9.016	-13.771**	-6.876	-0.405	-6.668	-24.67**
		[0.31]	[2.36]	[1.28]	[0.50]	[1.58]	[2.54]
Lagged Dependent Variable	0.186	-0.020	0.026***	0.006	0.241***	0.017***	0.038
	[1.63]	[0.39]	[3.45]	[0.30]	[2.81]	[5.14]	[1.06]
Time Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	1,304	1,232	1,104	768	421	825	807
Countries	83	81	75	55	32	52	59

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute z-values in brackets.

Chapter 4

Economic Freedom in the Early 21st Century: Government Ideology Still Matters

Abstract[20]

Empirical studies show that government ideology has hardly influenced welfare expenditures since the 1990s, casting doubt on the general ability of national governments to design economic policies according to their programmatic appeals. This study takes a comprehensive view on policy-making by using a modified version of the Fraser institute's Economic Freedom of the World Index: I focus on the aspects of economic freedom that provoke party polarization and that national governments are capable to influence. The results suggest that government ideology still matters in the early 21st century: The empirical analysis of 36 OECD or new European Union member states from 2000 to 2012 shows that left-wing governments are associated with significantly lower economic freedom. Economic freedom continues to be the guiding principle that divides left and right in economic policy-making because the left still promotes far-reaching government spending and regulation.

[20] This chapter is based on my publication "Economic Freedom in the Early 21st Century: Government Ideology Still Matters." *Kyklos*, forthcoming in Volume 70, Issue 2.

4.1 Introduction

Economic policies have always received a great deal of public and scientific attention. Intellectuals, journalists, politicians, and citizens frequently disagree about the desired size and scope of government. The dispute on economic policies is based on different ideological convictions that party competition often reflects: Left-wing parties prefer an activist state which would aim to rectify economic inequality through regulation and redistributive policies. Right-wing parties in contrast advocate a free-market economy with restrictions on state intervention to avoid market distortions.

But the established polarization between left and right on economic policies has recently been called into question. Rodrik (2011) argues that government ideology retreats to the background because of external constraints such as globalization, which would subordinate democratic governance. Iversen and Soskice (2015) disagree, maintaining that national governments still have the authority to shape their economies on predictable partisan lines, but the declining class cleavage forces them to adopt their policy stances in order to appeal to a wider audience.

The empirical evidence is mixed in the OECD. Some studies show that the partisan effect disappears for some areas, particularly for welfare spending (Garrett and Mitchell 2001; Huber and Stephens 2001; Kittel and Obinger 2003; Potrafke 2009; Kwon and Pontusson 2010; Herwartz and Theilen 2014), while it remains strong for market regulation and privatization (Bortolotti and Pinotti 2008; Iversen and Stephens 2008; Potrafke 2010a; Obinger et al. 2014).

The previous studies have mostly focused on selected areas of economic policy-making in order to reach their conclusions on the influence of government ideology. I use the Fraser institute's Economic Freedom of the World (EFW) Index to provide a unified measurement for many aspects of economic policies.

The EFW Index measures a country's economic freedom for 42 variables, which are combined to form five distinct policy areas (Gwartney et al. 2014). In order to study the influence of government ideology, I only include policy areas in the index that provoke partisan disagreement and that are controlled by the national government. The result is a modified EFW Index that consists of all policy-areas for which political economists discuss the role of government partisanship: Government expenditures, transfers, subsidies, privatization, government investment, income and payroll tax policies, and the regulation of labor and business.

Based on the modified EFW Index, this study wants to investigate the following question:

Are left-wing governments more active in restricting economic freedom?

The empirical analysis is based on a time-series cross-sectional analysis for 36 OECD or new European Union member states during the period of 2000 to 2012. The findings suggest that government partisanship still plays an important role in designing economic policies: Left-wing governments are significantly more likely than right-wing administrations to restrict economic freedom.

4.2 Does government ideology still matter?

4.2.1 The classic partisan hypothesis

The polarization of political parties across a programmatic left-right dimension is constitutive for historical cleavage theorists and for spatial theorists of party competition (Kitschelt 2000: 846). In both traditions, government accountability and responsiveness arise from implementing the economic policies that the public desires. If parties polarize and offer a distinctive ideological program, voters are supposed to have a clear choice at the ballot-box. Voters could use ideologies and party labels as a shortcut to reduce information cost and may still reach rational decisions (Lupia and McCubbins 1998).[21]

Given the importance of partisan differences for democratic legitimacy, scholars have continuously evaluated how parties differ across the left-right continuum. Hibbs (1977) argues that left-leaning governments prefer reducing unemployment while a right-wing government would opt for price stability, assuming a politically exploitable Phillips curve trade-off between unemployment and inflation. Studies show that left-wing governments have expanded the scope and expenditures of the welfare state up until the 1980s (Esping-Andersen 1985; Hicks and Swank 1992; Huber et al. 1993; Hicks 1999; Iversen and Cusack 2000). The classic partisan hypothesis suggests that a left-wing government implements expansionary fiscal and monetary policies to decrease unemployment, whereas a right-wing counterpart prefers lower inflation and implements restrictive fiscal and monetary policies.

[21] For a critical discussion of how partisanship could lead to biased information processing instead of rational decisions, see Friedman (2006).

4.2.2 Government ideology in an era of austerity and globalization

The classic partisan hypothesis has come under attack by newer empirical findings. They suggest that the partisan effect on welfare expenditures has disappeared since the 1990s (Garrett and Mitchell 2001; Huber and Stephens 2001; Kittel and Obinger 2003; Potrafke 2009; Kwon and Pontusson 2010; Herwartz and Theilen 2014).

The literature provides several explanations for the disappearing partisan effect, highlighting the rise of economic constraints, such as the shift to a postindustrial economy (Iversen and Cusack 2000), an aging population (Tepe and Vanhuysse 2009), and expanding international competition through globalization (Frieden and Rogowski 1996; Rodrik 2011). Economic constraints would force leftist governments to refrain from further expanding the welfare state, but popular support for the existing welfare state would also restrict the efforts of right-wing governments to cut back on welfare benefits in the "era of new politics" (Pierson 1996, 2001).

But the influence of external constraints on policy-making should not be overemphasized. Globalization leads to increased competition, economic integration and mobile capital, but the development has not triggered a race-to-the-bottom of welfare spending, taxation, or labor market regulation (Schulze and Ursprung 1999; Dreher 2006a; Dreher et al. 2008; Plümper et al. 2009; Potrafke 2010b, Potrafke 2015).

Different outcomes in economic policy-making can be reliably linked to government ideology in the OECD (Boix 1998; Korpi and Palme 2003): Left-wing governments tend to enact more protective labor market regulation (Botero et al. 2004) and spend more on work training (Iversen and Stephens 2008). By contrast, right-wing governments are relatively more supportive of deregulating product markets (Potrafke 2010a) and privatization (Bortolotti and Pinotti 2008; Obinger et al. 2014).

External constraints have certainly affected policymaking and party competition. But it remains questionable whether they undermine governments' general ability to shape the economy according to partisan goals.

4.3 Drawing a more comprehensive picture: Economic freedom and government ideology

4.3.1 Why economic freedom is a guiding principle for party competition

The previous discussion has shown that it is insufficient to focus on only one or a few aspects of policy-making in order to evaluate the partisan hypothesis. This section suggests that economic freedom is a comprehensive concept that accounts for existing partisan differences in economic policy making.

The underlying concepts of economic freedom are "(1) personal choice, (2) voluntary exchange coordinated by markets, (3) freedom to enter and compete in markets, and (4) protection of persons and their property from aggression by others" (Gwartney et al. 2014: 1). Economic freedom is a core principle that separates left and right on the economic dimension of party competition. Kitschelt and Rehm (2014: 1671) summarize the left-right divide with the following question: "Should the polity authoritatively (re)allocate resources in an egalitarian fashion to all members or should privilege or the spontaneous inequality of the market place have free reign and govern the acquisitiveness of members?"

Potrafke (2010a: 136) describes the Austrian School of Economics by Ludwig von Mises and Friedrich von Hayek, and the Chicago School by Milton Friedman, as the main philosophical champions of economic freedom. The Austrian and Chicago schools of thought have a lasting impact on the political ideas held by the political right, as evidenced by Margaret Thatcher's or Ronald Reagan's admiration for Friedman or Hayek (Jones 2014).[22]

As a consequence of the continuously decline of the size of the working class, the left needed to adapt its economic program to attract new voters among the middle class (Kitschelt 1994; Bartolini 2000; Arndt 2014). Full-time working women and higher educated sociocultural professionals in public service sector jobs have become core supporters of left-wing parties (Iversen and Rosenbluth 2006; Kitschelt and Rehm 2014). Programmatically, the left appeals to their new constituents by promoting the provision of

[22] More examples of governing politicians who explicitly refer to the Austrian or Chicago schools or were awarded by free-market think tanks include, but are not limited to, John Howard (Australia), Stephen Harper (Canada), Václav Klaus (Czech Rep.), Anders Fogh Rasmussen in early writing (Denmark), Andrus Ansip, Mart Laar (Estonia), Sauli Niinistö (Finland), Jean-Pierre Raffarin (France), Valdis Dombrovskis (Latvia), Leszek Balcerowicz (Poland), Mikuláš Dzurinda, Ivan Mikloš, and Robert Sulik (Slovakia).

public sector jobs, and by emphasizing active state policies, such as government investment in education and vocational skills (Iversen and Stephens 2008; Häusermann et al. 2013: 226-8). The left also embraces business and labor market regulations in order to address social risks that their electorate is facing. Regulatory proposals range from laws protecting full-time employees from their dismissal (Rueda 2007) to fostering child care facilities and parental leave policies (Häusermann 2006). Left-wing cultural values also spill over into the economic realm as most left-wing parties support tougher employment regulation through gender quotas or anti-discrimination laws (Terjesen et al. 2015).

These left-wing policies are hardly in accordance with the principle of economic freedom. Even though mainstream left-wing parties have accepted or initiated some free-market reforms – such as Anthony Blair's Labour government in the UK or Gerhard Schröder's leftist red-green coalition in Germany – there should be on average a significant reduction in economic freedom when the left governs.

4.3.2 Modifying the Economic Freedom of the World Index

The EFW Index by the Fraser Institute is considered the gold standard to measure economic freedom (Dawson 2007: 185). Most scholar utilize the EFW Index as the main explanatory variable to evaluate whether economic freedom can explain desirable outcomes. For instance, they demonstrate a positive association of economic freedom with economic development (Gwartney et al. 2006), democratic institutions (Peev and Mueller 2012), social trust (Berggren and Jordahl 2006), and tolerance (Berggren and Nilsson 2013).

Only a few studies examine the influence of government ideology on economic freedom. On the federal level, right-wing government ideology is associated with more freedom on labor markets in American and Canadian states (Bjørnskov and Potrafke 2012, 2013) and with economic freedom in Western German states (Potrafke 2013). But there is only one time-series cross-sectional analysis of the relationship between the EFW Index and government ideology: Pitlik (2007) uses five-year averages for 23 OECD countries to show that right-wing governments are relatively more supportive of economic freedom over the period 1970-2000.

It is, however, necessary to modify Pitlik (2007)'s work and to re-examine the relationship between economic freedom and government ideology for three reasons:

First, his period of observation ranges from 1970 to 2000 and thereby conflates the early decades, for which the literature considers government ideology to be relevant, with

the period, for which many political economists dispute the influence of government ideology. This study aims to focus solely on the early 21st century to evaluate whether government ideology has recently retired to the background.

Second, using five-year averages does not capture the effects of government ideology if the composition of government changes more frequently. Specifically, five-year averages cannot exclude the possibility of an inverse partisan effect. For instance, let's assume that a country has a right-wing government at period t and that the administration does not change economic freedom; the left wins the election at t+3 and strongly increases economic freedom in the next year. Averaging over five years yields a dominant right-wing government composition and a net increase in economic freedom, thereby falsely confirming the partisan hypothesis. The limited availability of data forced Pitlik (2007) to rely on five-year averages, because the Fraser Institute publishes their EFW Index only annually since 2000.

Third, Pitlik (2007) employs the complete EFW Index score as dependent variable. But the recent delegation of policy competences implies that national governments do not have full authority on all areas of economic policy-making anymore. In a similar case, Potrafke (2013)'s analysis of economic freedom in German states adjusts the economic freedom index to exclude policy areas for which the federal states have limited or no authority.

As a consequence of the discussed limitations, this study extends the annual period of observation from 2000 to 2012 to evaluate whether government ideology still matters in an era of austerity and globalization, and to exclude the possibility of inverse partisan effects. It modifies the EFW Index to only include 1) policy areas that national governments generally control, and 2.) policy areas that exhibit ideological polarization between left and right.

Table 4.1 graphically summarizes the modification of the EFW Index. The EFW Index consists of five equally weighted policy areas: Size of Government; Legal System and Security of Property Rights; Sound Money; Freedom to Trade Internationally; and Credit, Labor, and Business Regulation.

"Size of Government" includes government consumption, transfers and subsidies, privatization and government investment, and income and payroll taxes. National govern-

ments have not delegated competences to external institutions and parties differ ideologically for the desired scope and size of government. "Size of Government" consequently remains in the EFW Index.

Table 4.1: Modifying the EFW Index: Which areas should be considered?

	Controlled by national government?	Mainstream party polarization?	Part of Modified EFW Index?
Area 1 Size of Government Government Consumption Transfers and Subsidies Privatization and Government Investment Tax Rates	✓	✓	✓
Area 2 Legal System and Property Rights	✓	✗	✗
Area 3 Sound Money	✗	✓	✗
Area 4 Freedom to Trade Internationally	✗	✓	✗
Area 5a Credit Market Regulation	✗	✓	✗
Area 5b Labor Market Regulation	✓	✓	✓
Area 5c Business Regulation	✓	✓	✓

However, this is not the case for Areas 2 to 4. A left-right conflict for Area 2 "Legal System and Security of Property Rights" has disappeared since virtually all mainstream left-wing parties accept secure property rights. The other items of Area 2 appear to be

desirable outcomes such as sound law enforcement and keeping the military out of politics. They are issues of valence competition, but not of programmatic disagreement. Consequently, Area 2 is not part of the modified EFW Index.

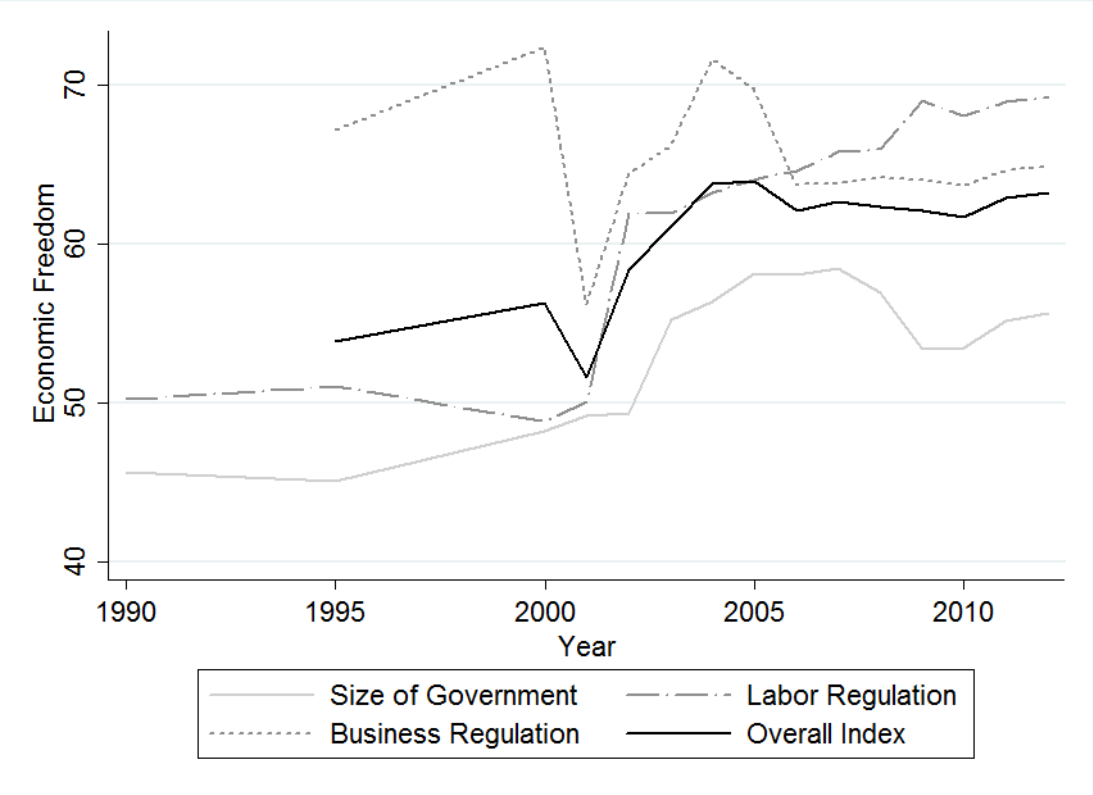
The large mainstream parties could still have different preferences for monetary and trade policies of Areas 3 and 4, but domain authority for both areas has largely been delegated to external institutions. Most countries have adopted independent central banks, or completely given up national monetary policy as in the case of the European Central Bank (Arnone et al. 2007). The delegation of monetary policy does not appear to be statistically related to partisanship (Way 2000; Gilardi 2007). Similarly, tariffs, capital controls, and travel restrictions have been abolished within the EU. Bilateral or general trade agreements often regulate the ability of administrations to impose new tariffs and restrictions. As governments cannot substantially alter economic freedom in Area 3 "Sound Money" and Area 4 "Freedom to Trade," both areas are removed from the modified EFW index.

Area 5 refers to the regulation of capital, labor and business. Government still have the capacity to shape business and labor market regulation. An expert survey indicates that left- and right-wing parties substantially differ in their preferences regarding regulation across different sectors (Benoit and Laver 2006). Thus, the modified EFW index includes business and labor market regulation.

Parties could disagree over the regulation of credit markets, but national governments have limited say in this area. The interest rate policy by the central bank and the course of the business cycle strongly influence the score for credit regulation. For instance, the Great Recession caused a drastic drop in the score for most countries – suggesting that governments can play a minor role at best in influencing the score. As a consequence, the modified EFW index does not include credit market regulation.

The modified EFW Index consists of the three equally weighted areas "Size of Government", "Labor Market Regulation" and "Business Regulation" and is multiplied by 10 to range from 0 (the least economic freedom) to 100 (highest economic freedom). Figure 4.1 shows the development of the modified EFW Index and the three sub-areas since the 1990s. Economic freedom strongly increases across all areas in the first years of the 21st century, but the three areas subsequently diverge. While economic freedom in Labor Regulation increases slightly, it decreases for Size of Government and Business Regulation; overall economic freedom reaches its highest value in 2005 and remains stagnant until 2012.

Figure 4.1: Average development of modified EFW Index and of the three policy areas



4.4 Empirical analysis

4.4.1 Data overview and some anecdotal evidence

The study covers the following 36 OECD or new European Union member states from 2000 to 2012: Australia, Austria, Belgium, Bulgaria, Canada, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, Switzerland, the UK, and the USA.[23]

I use the first differences of the modified EFW Index as dependent variable to control for autocorrelation. Armingeon et al.'s Comparative Political Data Set III (2014) provides the partisan measurement as main explanatory variable. "Government Ideology" is based

[23] The analysis does not include the OECD member states Chile, Israel, Mexico, South Korea, and Turkey, because they are not part of the Comparative Political Data Set III.

on the composition of cabinet posts, ranging from one to five. The categories of "Government Ideology" are the following: Hegemony of right-wing (and center) parties (percentage left cabinet posts=0), dominance of right-wing (and center) parties (left<33.3), balance of power between left and right/center (33.3<left<66.6), dominance of social-democratic and other left parties (left>66.6), hegemony of social-democratic and other left parties (left=100). The correlation coefficient between the modified EFW Index and Government Ideology is -0.23.

Figure 4.2 shows the mean changes in economic freedom for each five categories of Government Ideology. Hegemonic right-wing governments have the highest value with an average annual increase in economic freedom of 1.02 points. The remaining values are not categorically decreasing as a balanced government (0.69) has a higher score than a dominant right-wing government (0.50), and a hegemonic left-wing government (0.07) exceeds a dominant left-wing government (-0.12).

Figure 4.2: Mean changes in EFW Index based on government ideology

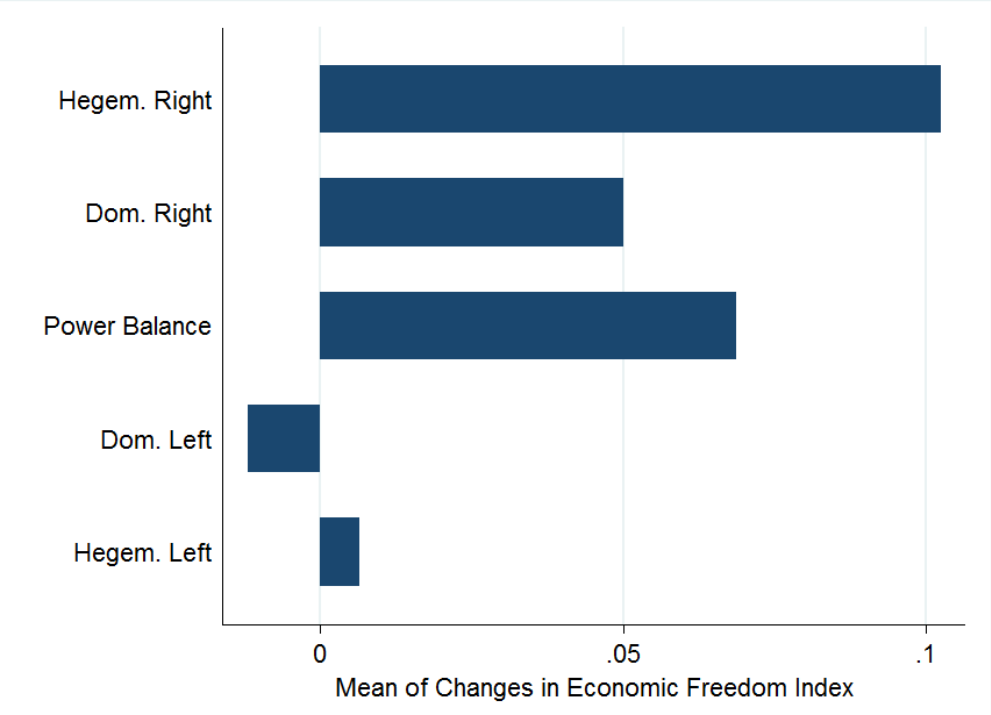


Figure 4.2 suggests that economic freedom remains rather stagnant under left-wing governments and increases under a right-wing administration. A t-test on means shows that hegemonic and dominant left-wing governments differ significantly in changing economic freedom: Grouping both leftist government types together yields a mean of -0.02

for changes in economic freedom, while the average annual change for all other government types is 0.82. The difference is significant with a t-value of 2.26 on the 95 percent confidence level. Alternative categorizations that are based on a leftist government portfolio of at least 50 or 34 percent are also significant different from other, non-leftist government types.[24]

Some anecdotal evidence could suggest that left and right differ significantly from each other in their mean economic freedom score. Under the hegemonic left governments of Portugal and Spain, changes in economic freedom were always negative between 2005 and 2010, with an overall reduction of about five and eight points. In Austria, the right-wing "ÖVP-FPÖ government has pursued particularly rapid rate of privatisation" (Hofbauer 2006: 16), leading to more economic freedom of over seven points between 2002 and 2005. And in Australia, the right-wing Howard administration increased economic freedom by over 12 points between 2000 and 2007. Howard enacted labor market deregulation that has been described as "the most fundamental recasting of the industrial relations system in over 100 years" (Hall 2006: 291) – until Rudd's Labor Party returned to power and overturned this reform, reducing overall economic freedom by nearly seven points until 2012. Similarly, right-wing governments in Slovakia (2004), the Czech Republic (2007), and Hungary (2011) increased their economic freedom score by about six, three, and one point(s) in just one year by introducing a flat tax regime. As a first reelection measure, the Slovakian left-wing government brought a progressive income tax scheme back into effect in January 2013.

4.4.2 Model specification and empirical analysis

The empirical analysis is based on the following regression equation:

$$\Delta\, Modified\ EFW\ Index_{it} = \alpha + \beta\ Government\ Ideology_{it} + \sum_{j=0}^{M} \gamma_j X_{ijt} + \pi_i + \tau_t + \varepsilon_{it} \quad (1)$$

with i = 1, …, 36 (number of countries); t = 1, …, 12 (number of years); j = 0, …, M (number of other explanatory variables)

[24] The average change in economic freedom for governments with a leftist government portfolio of at least 50 (34) percent is 0.05 (0.15) while it is 0.85 (0.92) for all other government types. The differences are significant at the 95 percent confidence level with a t-value of 2.29 (2.33).

where "Δ Modified EFW Index" measures the first differences of the modified EFW Index and is the dependent variable, while "Government Ideology" denotes the main explanatory variable.

"$\sum X_{ijt}$" contains other explanatory variables as controls. The International Country Risk Guide provides a measurement for government stability and public popularity, as governments could shy away from economic reforms if they have to face falling approval rates. The variable "Government Stability" combines the three subcomponents government unity, legislative strength, and popular support,[25] which ranges from 0 to 12.

Moreover, effective domestic veto players can also restrict governments from enacting economic reforms (Tsebelis 1995). Hallerberg and Basinger (1998: 339) show that a high number of veto players leads to a status quo bias in tax policies. The Political Constraints Index 5 by Henisz (2000) accounts for "Veto Players" within the executive, two legislative chambers, the federal level, and the judiciary. "Veto Players" potentially ranges from 0 to 1. The dummy "Government Change" indicates whether there was a turnover in government in a given year. "EU" denotes whether a country is a member of the European Union.

Table 4.2: Descriptive statistics

	Obs	Min	Max	Mean	Std. dev.
Mod. EFW Index	428	41.05	80.28	61.40	7.86
Δ EFW Index	424	-12.42	11.96	0.60	3.35
Government Ideology	431	1	5	2.40	1.45
Government Stability	432	4.04	11.08	8.19	1.32
Veto Player	432	0.34	0.89	0.77	0.08
Government Change	432	0	1	0.26	0.44
EU	432	0	1	0.65	0.47
KOF Globalization Index	432	58.93	92.37	80.52	7.57
Δ KOF Globalization Index	432	-4.80	10.61	0.26	1.52
GDP per Capita	432	2.94	86.13	30.20	18.17
Δ GDP per Capita	432	-6.01	4.02	0.30	0.94
Unemployment	432	1.8	25.2	7.79	3.97
Δ Unemployment	432	-5.4	9.70	0.13	1.56
Debt	424	7.31	218.80	60.95	36.55
Δ Debt	423	-15.33	48.93	1.92	6.20

[25] The International Country Risk Guide does not separately provide the three subcomponents as individual measurements.

The next variables relate to external constraints. First differences of Dreher (2006b)'s KOF Index of Globalization combine social, political, and economic dimensions to provide a comprehensive measurement for globalization. And the analysis includes the first differences of the following domestic economic constraints: real GDP per capita in thousand US$, unemployment rate, national debt, as drawn from the World Bank Global Development Indicators. Additionally, the level of the EFW Index at t-1 is used as a control variable to capture converging trends. Table 4.2 shows the descriptive statistics of all variables and their first differences.

"π_i" denotes country fixed effects to control for country-specific time-invariant effects, such as national culture, federalism, the electoral or monetary systems; "τ_t" represents annual time effects to adjust for common positive or negative shocks; "ε_{it}" is the error term. The model specification is based on an ordinary least squares (OLS) regression with robust standard errors because the Breusch-Pagan test rejected the hypothesis of homoskedasticity.

It is possible, however, that government ideology has a time-delayed effect on economic freedom, and that some explanatory variables, such as GDP per capita or unemployment, might be affected by economic freedom. As a consequence, all explanatory variables are lagged by t-1 in additional model specifications in order to tackle potential time-lags and reverse causality issues.

Table 4.3 shows the regression results for five different models. The first model includes only Government Ideology as main explanatory variable and fixed and period effects. The second and third models add the other explanatory variables and the lagged level of economic freedom as controls. Models 4-6 re-examine the previous specifications with lagging the explanatory variables by t+1 to tackle potential endogeneity problems. Government Ideology has a negative sign and is statistically significant at the 99 percent confidence level in models 1, 2, 3, and 6, at the 95 percent confidence level in model 4, and at the 90 percent confidence level in model 5, indicating that left-wing governments are significantly more likely to restrict economic freedom.[26]

[26] Table 4.6 in the appendix also confirms the empirical results of Table 4.3 with dependent and continuous explanatory variables in levels based on a general least squares Prais-Winsten transformation with a first order autoregressive process (AR1), which accounts for the serial correlation of the dependent variable. The Prais-Winsten transformation provides a robustness test for the long-term effects of government ideology on economic freedom (Plümper et al. 2005: 349). Additional tests show that Government Ideology is not conditional on other factors, such as the age of the government (Table 4.7), government stability (Table 4.8), or veto players (Table 4.9), across all model specifications. An interaction term between Government Ideology and age of government is significantly positive at the 95 percent confidence interval for the model specifications of models 4 and 5; an interaction term between Government Ideology and veto players is significantly negative at the 95 percent confidence interval for model 5.

The significant negative coefficient for the lagged level of economic freedom suggests that countries with already high levels of economic freedom are associated with negative changes. Among the other variables measuring various constraints on government, none significantly affects economic freedom in all models; there is some evidence that EU membership has a positive influence on economic freedom when not controlling for the previous EFW level. Government Stability only appears to be conducive for economic freedom when it is lagged by one year in the full model. The results are mixed for the coefficient of changes in globalization. It is significantly positive but becomes significantly negative when the explanatory variables are lagged by one year.

Table 4.3: OLS regression analyses to explain first differences in economic freedom

	1	2	3	4	5	6
Government Ideology	-0.30***	-0.27***	-0.35***	-0.20**	-0.19*	-0.36***
	[2.91]	[2.60]	[3.74]	[2.06]	[1.81]	[3.97]
Government Stability		0.03	0.15		0.12	0.32***
		[0.28]	[1.44]		[0.96]	[2.68]
Veto Player		-1.07	-1.86		-1.83	-2.93
		[0.50]	[1.05]		[0.76]	[1.33]
Government Change		-0.07	-0.17		0.22	-0.00
		[0.23]	[0.67]		[0.75]	[0.01]
EU		0.40	1.83***		0.10	1.66***
		[0.53]	[2.92]		[0.15]	[2.91]
Δ Globalization		0.32**	0.20**		-0.24***	-0.21**
		[2.56]	[2.19]		[2.66]	[2.49]
Δ GDP per Capita		0.15	0.28**		-0.21	0.03
		[0.99]	[2.11]		[1.48]	[0.26]
Δ Unemployment		-0.03	-0.01		0.12	0.08
		[0.36]	[0.17]		[1.15]	[0.86]
Δ Debt		-0.01	-0.00		-0.03	-0.03*
		[0.55]	[0.10]		[1.36]	[1.79]
Level of Economic Freedom t-1			-0.42***			-0.46***
			[8.65]			[8.77]
Lagged Explanatory Variables	No	No	No	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	423	415	415	424	415	415
R-Squared	0.6026	0.6214	0.7201	0.5969	0.6135	0.7244

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

The numerical effect of Government Ideology appears to be quite large: A unit change in Government Ideology towards the left decreases the first differences of economic freedom by 0.19 to 0.36 points across the different model specifications, which equals about 5.7 to 10.7 percent of a standard deviation. Moving from a hegemonic right-wing to a hegemonic left-wing government reduces annual average changes in economic freedom by about 0.76 to 1.44 points, or by 22.6 to 43 percent of a standard deviation.

More evidence on the numerical effects of Government Ideology is obtained by relying on King et al. (2000)'s simulation-based approach. The Stata-software Clarify utilizes the results of the multiple regression analyses of Model 3 of Table 4.3 to draw 1000 sets of simulated coefficients from each posterior distribution to account for estimation uncertainty (Tomz et al. 2003). Government Ideology is set at one of its five values while all other explanatory variables are fixed at their means, yielding five counterfactual scenarios for the numerical effect of hegemonic right, dominant right, balanced, dominant left, and hegemonic left governments on the first differences of economic freedom.

Figure 4.3: Simulated effects of government ideology on first differences in economic freedom

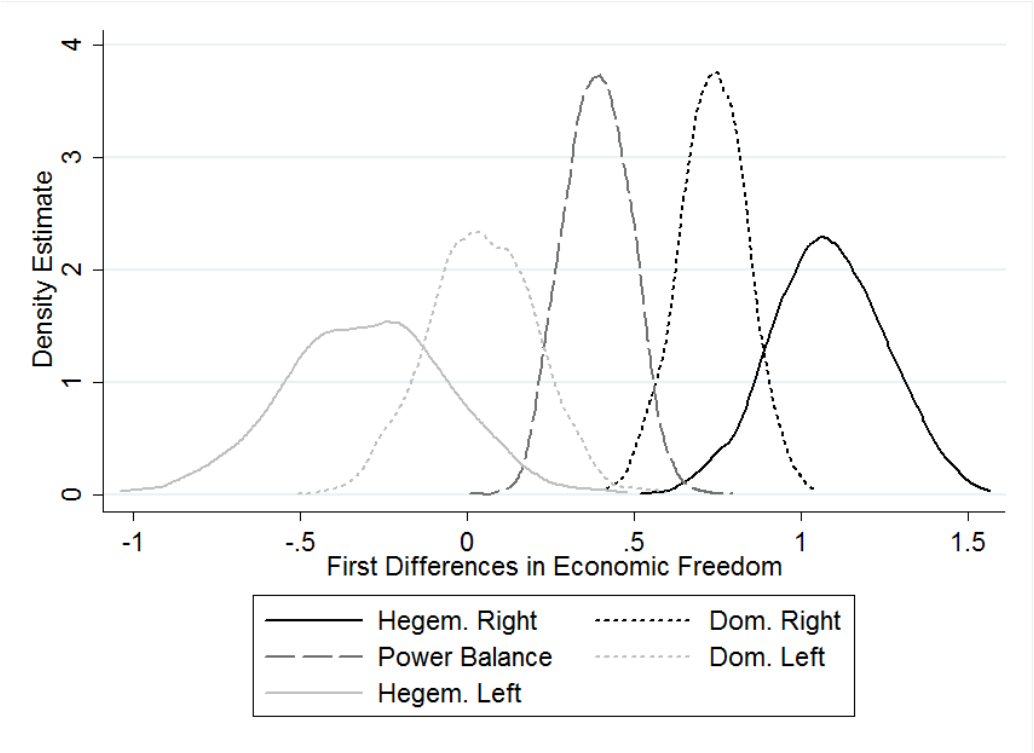


Figure 4.3 plots the density estimates for the five counterfactual scenarios over the first differences of economic freedom. As government ideology becomes more left-wing, the density estimates move to the left, indicating that left-wing governments tend to reduce economic freedom. On average, hegemonic left governments reduce the first differences of economic freedom by 0.30 points, and its density estimate is relatively steeper than the other distributions, which suggests that the variation among hegemonic left-wing governments in changing economic freedom is relatively larger. The average increases in first differences of economic freedom are 0.04 for dominant left governments, 0.39 for balanced governments, 0.74 for dominant right governments, and 1.08 for hegemonic right

governments. Thus, the average simulated difference between hegemonic left and right governments is about 1.38 points of the annual changes in economic freedom. As the density estimates for hegemonic left and right governments are not overlapping, we can confirm this numerical difference with a high degree of certainty (King et al. 2000: 357).

Table 4.4: Robustness tests – re-analyzing model 3 of Table 4.3 for different sub-samples

	Eurozone Member				Electoral System			
	Yes	**Yes**	**No**	**No**	**Plu-ral**	**Plu-ral**	**Prop.**	**Prop.**
Government Ideology	-0.34**	-0.42***	-0.33***	-0.34***	-0.43***	-0.32*	-0.32***	-0.37***
	[2.13]	[2.78]	[2.99]	[2.93]	[2.80]	[1.72]	[2.98]	[3.33]
Government Stability	0.10	0.17	0.22*	0.46***	0.19	0.53***	0.05	0.22
	[0.53]	[0.80]	[1.73]	[3.01]	[1.34]	[2.80]	[0.40]	[1.43]
Veto Player	0.21	-1.06	-5.71	-8.81*	2.30	13.00	-2.26	-3.70*
	[0.11]	[0.41]	[1.24]	[1.90]	[0.13]	[0.40]	[1.19]	[1.66]
Government Change	-0.17	-0.29	-0.10	-0.02	-0.07	-0.09	-0.15	0.06
	[0.52]	[0.82]	[0.28]	[0.06]	[0.14]	[0.16]	[0.53]	[0.22]
EU			2.31***	2.05***	4.45***	4.37***	1.43**	1.30**
			[3.34]	[3.13]	[3.58]	[2.67]	[2.13]	[2.08]
Δ Globalization	0.02	-0.07	0.34***	-0.29***	0.18	-0.03	0.22**	-0.23**
	[0.22]	[0.69]	[2.97]	[3.02]	[1.08]	[0.19]	[2.29]	[2.39]
Δ GDP per Capita	0.14	0.04	0.53**	0.02	0.28	-0.60	0.35**	0.08
	[1.00]	[0.27]	[2.19]	[0.10]	[0.61]	[1.40]	[2.35]	[0.54]
Δ Unemployment	-0.29*	-0.00	0.09	0.04	-0.21	0.22	-0.12	-0.00
	[1.96]	[0.03]	[0.80]	[0.35]	[1.44]	[1.34]	[1.39]	[0.04]
Δ Debt	0.00	-0.03	-0.03	-0.04	-0.02	-0.13**	0.01	-0.02
	[0.07]	[0.70]	[0.91]	[1.64]	[0.28]	[2.25]	[0.23]	[1.04]
Level of Economic Freedom t-1	-0.56***	-0.60***	-0.45***	-0.48***	-0.29***	-0.44***	-0.46***	-0.49***
	[6.81]	[7.03]	[7.73]	[7.75]	[3.44]	[4.30]	[8.19]	[8.12]
Lagged Expl. Variables	No	Yes	No	Yes	No	Yes	No	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	163	164	252	251	86	86	329	329
R-Squared	0.7856	0.7798	0.7360	0.7355	0.8715	0.8693	0.7125	0.7112

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

In order to evaluate whether a group of countries drives the significant results of Government Ideology, Table 4.4 divides the data into several subsamples based on membership in the Eurozone, and on electoral system. Eurozone membership might be another constraint thwarting government ideology, as southern Eurozone members, in particular, have limited capacities to fulfill their electoral promises since the advent of the euro crisis (Crum 2013). In the case of the electoral system the dominance of government ideology might be stronger in Australia, Canada, France, Japan, Lithuania, UK and USA, because countries with plurality formulas tend to produce two-party systems with one governing party. The proportional rules of the other countries in contrast tend to lead to multi-party systems with government coalitions.

Table 4.4 shows that the coefficient for Government Ideology stays significant in all subsamples with contemporaneous and lagged explanatory variables. The findings of Table 4.4 suggest that a cluster of countries does not drive the negative association between left-wing government and economic freedom.

Table 4.5: Robustness tests – using first differences of other economic freedom indices as dependent variable

	1	2	3	4	5	6
Government Ideology	-0.31***	-0.33***	-0.26**	-0.32***	-0.16***	-0.10*
	[3.06]	[3.47]	[2.44]	[2.89]	[2.83]	[1.77]
Government Stability	0.20*	0.33**	0.26*	0.32**	-0.07	0.09
	[1.75]	[2.48]	[1.87]	[2.02]	[0.93]	[1.08]
Veto Player	-2.89	-3.66	-4.24	-4.83*	0.45	-1.68
	[1.31]	[1.53]	[1.48]	[1.74]	[0.36]	[1.53]
Government Change	-0.16	-0.05	-0.22	0.02	-0.05	0.16
	[0.59]	[0.18]	[0.66]	[0.07]	[0.34]	[0.90]
EU	1.63**	1.43**	1.02	1.00	1.49***	0.69
	[2.27]	[2.35]	[1.07]	[1.32]	[2.76]	[1.36]
Δ Globalization	0.16*	-0.22***	0.13	-0.22**	0.20***	-0.08
	[1.89]	[2.62]	[1.39]	[2.42]	[2.91]	[1.36]
Δ GDP per Capita	0.30**	0.07	0.34*	0.07	0.09	-0.02
	[2.03]	[0.44]	[1.94]	[0.40]	[1.22]	[0.19]
Δ Unemployment	-0.01	0.07	-0.02	0.05	-0.03	0.01
	[0.12]	[0.75]	[0.24]	[0.50]	[0.62]	[0.10]
Δ Debt	-0.01	-0.04**	-0.02	-0.05**	-0.05**	-0.03*
	[0.53]	[1.98]	[0.71]	[2.03]	[2.05]	[1.87]
Level of Economic Freedom t-1	-0.40***	-0.43***	-0.38***	-0.41***	-0.35***	-0.33***
	[8.75]	[9.17]	[8.00]	[8.32]	[8.14]	[6.89]
Lagged Expl. Variables	No	Yes	No	Yes	No	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	415	415	405	405	422	422
R-Squared	0.6311	0.6383	0.5357	0.5440	0.5652	0.5143

Note: The weighting of the specifications is the following:
Models 1-2: Size of Government (1/2), Labor Regulation (1/4), Business Regulation (1/4)
Models 3-4: Government Consumption (1/6), Transfers and Subsidies (1/6), Privatization and Government Investment (1/6), Tax Rates (1/6), Labor Regulation (1/6), Business Regulation (1/6)
Models 5-6: Original EFW Index: Size of Government (1/5), Legal System and Property Rights (1/5), Sound Money (1/5), Freedom to Trade Internationally (1/5), Credit Market Regulation (1/15), Labor Market Regulation (1/15), Business Regulation (1/15); * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. Absolute t-values in brackets.

As another robustness test, Table 4.5 replaces the dependent variable with the first differences of alternative measurements of economic freedom to examine if the empirical results are a result of selection bias caused by modifying the EFW Index in section 3.2. Models 1-4 adjust the weighting of the three sub-areas of the modified EFW Index in the following way: Models 1-2: Size of Government (1/2), Business Regulation (1/4) and Labor Regulation (1/4); Models 3-4: Size of Government (4/6 to account for each of its four subareas), Business Regulation (1/6) and Labor Regulation (1/6).

Models 5-6 are based on the original EFW Index. Using the first differences of the original EFW Index as dependent variable is a strong robustness test for the validity of the partisan hypothesis because national governments have only limited or no authority to directly influence the remaining policy areas of the EFW Index. These previously excluded areas account for 2/3 of the weighting of the original EFW Index.

Table 4.5 shows that Government Ideology remains significantly negative in the first four model specifications. The results indicate that the negative relationship between left-wing partisanship and economic freedom is robust for weighting changes in the composition of the modified EFW Index. While the coefficient for Government Ideology shrinks in Models 5 and 6, the coefficient remains significant at the 99 and 90 percent confidence level.

Overall, the robustness tests tend to confirm the continuing influence of government ideology on economic policy-making.

4.5 Conclusion

The influence of government ideology on economic policies remains vitally important for democratic legitimacy and government accountability, leading to recurring interest on how government ideology leaves its programmatic footprint in the economy.

In the "Golden Age" of the welfare state, national governments had the sovereignty and fiscal capacity to shape monetary and welfare policies according to their ideological manifestos until the 1980s (Esping-Andersen 1996). But expanding global markets, the shift to a postindustrial society, and tightening fiscal conditions have distinctively changed party politics in recent decades. International organizations such as the EU have increasingly encroached on the national sovereignty of economic policy-making; delegating monetary policy to independent central banks has become a global trend. Fiscal constraints have forced many governments to cut back on social benefits and restructure the welfare state, sometimes even orchestrated by leftist administrations.

But this does not imply that partisanship is generally retrenching. The empirical section shows that government ideology still matters for economic policy-making when using a comprehensive measurement that includes government consumption, transfers, subsidies, privatization, government investment, tax policies and labor and business regulation from the EFW Index. As the partisan hypothesis suggests, left-wing administrations still tend to be more active in restricting economic freedom.

What could explain the persistent influence of government ideology? The disappearing partisan effect in some domains could have actually fostered a distinct partisan effect in other policy areas. Delegating monetary policy and restructuring the welfare state could have freed up the financial and political capital that governing parties need to impose their program on other areas of the economy (Dellepiane-Avellaneda 2013).

The shift to new economic policies might have been an electoral necessity, particularly for the mainstream left. The ongoing shift to a postindustrial economy in the OECD and Europe has affected the composition of their electorate: The working class voting bloc has become less important for left-wing parties, which needed to adopt their program to successfully appeal to new middle-class voters. But it would be mistaken to believe that voter realignment has generated left-wing policy proposals that are similar to those preferred by the political right. In fact, both old and new left-wing agendas continue to share a commitment for active state policies that effectively restrict economic freedom relative to policies by right-wing parties.

References

Armingeon, Klaus, Laura Knöpfel, David Weisstanner, and Sarah Engler. 2014. *Comparative Political Data Set III 1990-2012*. Institute of Political Science, University of Bern.

Arndt, Christoph. 2014. "Social democracy's mobilization of new constituencies. The role of electoral systems." *Party Politics* 20(5): 778-790.

Arnone, Marco, Bernard Laurens, Jean-François Segalotto, and Martin Sommer. 2007. "Central bank autonomy: lessons from global trends." IMF Working Paper WP/07/88.

Bartolini, Stefano. 2000. *The political mobilization of the European left, 1860-1980: The class cleavage*. Cambridge: Cambridge University Press.

Benoit, Kenneth, and Michael Laver (2006). *Party policy in modern democracies*. London: Routledge.

Berggren, Niclas, and Henrik Jordahl. 2006. "Free to trust: Economic freedom and social capital." *Kyklos* 59(2): 141-169.

Berggren, Niclas, and Therese Nilsson. 2013. "Does economic freedom foster tolerance?." *Kyklos* 66(2): 177-207.

Bjørnskov, Christian, and Niklas Potrafke. 2012. "Political ideology and economic freedom across Canadian provinces." *Eastern Economic Journal* 38(2): 143-166.

Bjørnskov, Christian, and Niklas Potrafke. 2013. "The size and scope of government in the US states: does party ideology matter?." *International Tax and Public Finance* 20(4): 687-714.

Boix, Carles. 1998. *Political parties, growth and equality: Conservative and social democratic economic strategies in the world economy.* Cambridge: Cambridge University Press

Bortolotti, Bernardo, and Paolo Pinotti. 2008. "Delayed privatization." *Public Choice* 136(3-4): 331-351.

Crum, Ben. 2013. "Saving the Euro at the Cost of Democracy?." *Journal of Common Market Studies* 51(4): 614-630.

Dawson, John W. 2007. "The empirical institutions-growth literature: is something amiss at the top?." *Econ Journal Watch* 4(2): 184-196.

Dellepiane-Avellaneda, Sebastian. 2013. "Gordon unbound: The heresthetic of central bank independence in Britain." *British Journal of Political Science* 43(2): 263-293.

Dreher, Axel. 2006a. "The influence of globalization on taxes and social policy: An empirical analysis for OECD countries." *European Journal of Political Economy* 22(1): 179-201.

Dreher, Axel. 2006b. "Does globalization affect growth? Evidence from a new index of globalization." *Applied Economics* 38(10): 1091-1110.

Dreher, Axel, Jan-Egbert Sturm, and Heinrich W. Ursprung. 2008. "The impact of globalization on the composition of government expenditures: Evidence from panel data." *Public Choice* 134(3-4): 263-292.

Esping-Andersen, Gøsta (ed.). 1996. *Welfare states in transition: national adaptations in global economies*. London: Sage.

Frieden, Jeffry A., and Ronald Rogowski. 1996. "The impact of the international economy on national policies: An analytical overview." Pp. 25-47 in: Robert O. Keohane and Helen V. Milner (eds.): *Internationalization and domestic politics*. Cambridge: Cambridge University Press.

Friedman, Jeffrey. 2006. "Democratic Competence in Normative and Positive Theory: Neglected Implications of 'The Nature of Belief Systems in Mass Publics'." *Critical Review* 18(1-3): i-xliii.

Garrett, Geoffrey, and Deborah Mitchell. 2001. "Globalization, government spending and taxation in the OECD." *European Journal of Political Research* 39(2): 145-177.

Gilardi, Fabrizio. 2007. "The same, but different: Central banks, regulatory agencies, and the politics of delegation to independent authorities." *Comparative European Politics* 5(3): 303-327.

Gwartney, James D., Randall G. Holcombe, and Robert A. Lawson. 2006. "Institutions and the Impact of Investment on Growth." *Kyklos* 59(2): 255-273.

Gwartney, James, Robert Lawson, and Joshua Hall (eds.). 2014. *Economic Freedom of the World: 2014 Annual Report.* Vancouver: Fraser Institute.

Hall, Richard. 2006. "Australian industrial relations in 2005-The WorkChoices revolution." *Journal of Industrial Relations* 48(3): 291-303.

Hallerberg, Mark, and Scott Basinger. 1998. "Internationalization and Changes in Tax Policy in OECD Countries The Importance of Domestic Veto Players." *Comparative Political Studies* 31(3): 321-352.

Häusermann, Silja. 2006. "Changing coalitions in social policy reforms: the politics of new social needs and demands." *Journal of European Social Policy* 16(1): 5-21.

Häusermann, Silja, Georg Picot, and Dominik Geering. 2013. "Review article: rethinking party politics and the welfare state–recent advances in the literature." *British Journal of Political Science* 43(1): 221-240.

Henisz, Witold J. 2000. "The institutional environment for economic growth."*Economics & Politics* 12(1): 1-31.

Herwartz, Helmut, and Bernd Theilen. 2014. "Partisan influence on social spending under market integration, fiscal pressure and institutional change." *European Journal of Political Economy* 34: 409-424.

Hibbs, Douglas A. 1977. "Political parties and macroeconomic policy." *American Political Science Review* 71(4): 1467-1487.

Hicks, Alexander M. 1999. *Social democracy & welfare capitalism: a century of income security politics.* Ithaca: Cornell University Press.

Hicks, Alexander M., and Duane H. Swank. 1992."Politics, Institutions, and Welfare Spending in Industrialized Democracies, 1960–82." *American Political Science Review* 86(3): 658-674.

Hofbauer, Ines. 2006. *Liberalisation, privatisation and regulation in the Austrian electricity sector. Country reports on liberalisation and privatisation processes and forms of regulation*. Vienna: Forschungs- und Beratungsstelle Arbeitswelt.

Huber, Evelyne, Charles Ragin, and John D. Stephens. 1993. "Social democracy, Christian democracy, constitutional structure, and the welfare state." *American Journal of Sociology* 99(3): 711-749.

Huber, Evelyne, and John D. Stephens. 2001. *Development and crisis of the welfare state: parties and policies in global markets.* Chicago: University of Chicago press.

Iversen, Torben, and Thomas R. Cusack. 2000. "The causes of welfare state expansion: deindustrialization or globalization?." *World Politics* 52(3): 313-349.

Iversen, Torben, and Frances Rosenbluth. 2006. "The Political Economy of Gender: Explaining Cross-National Variation in the Gender Division of Labor and the Gender Voting Gap." *American Journal of Political Science* 50(1): 1-19.

Iversen, Torben, and David Soskice. 2015. "Redistribution and the Power of the Advanced Nation State: Government Responses to Rising Inequality." Pp. 287-305 in: Jon Erik Dølvik and Andrew Martin (eds.): *European Social Models from Crisis to Crisis. Employment and Inequality in an Era of Monetary Integration*. Oxford: Oxford University Press.

Iversen, Torben, and John D. Stephens. 2008. "Partisan politics, the welfare state, and three worlds of human capital formation." *Comparative Political Studies* 41(4-5): 600-637.

Jones, Daniel S. 2014. *Masters of the universe: Hayek, Friedman, and the birth of neoliberal politics.* Princeton: Princeton University Press.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the most of statistical analyses: Improving interpretation and presentation." *American Journal of Political Science* 44(2): 347-361.

Kitschelt, Herbert. 1994. *The transformation of European social democracy*. Cambridge: Cambridge University Press.

Kitschelt, Herbert. 2000. "Linkages between citizens and politicians in democratic polities." *Comparative Political Studies* 33(6-7): 845-879.

Kitschelt, Herbert, and Philipp Rehm. 2014. "Occupations as a site of political preference formation." *Comparative Political Studies* 47(12): 1670-1706.

Kittel, Bernhard, and Herbert Obinger. 2003. "Political parties, institutions, and the dynamics of social expenditure in times of austerity." *Journal of European Public Policy* 10(1): 20-45.

Korpi, Walter, and Joakim Palme. 2003. "New politics and class politics in the context of austerity and globalization: Welfare state regress in 18 countries, 1975–95." *American Political Science Review* 97(3): 425-446.

Kwon, Hyeok Yong, and Jonas Pontusson. 2010. "Globalization, labour power and partisan politics revisited." *Socio-Economic Review* 8(2): 251-281.

Lupia, Arthur, and Mathew D. McCubbins. 1998. *The democratic dilemma: Can citizens learn what they need to know?*. Cambridge: Cambridge University Press.

Obinger, Herbert, Carina Schmitt, and Reimut Zohlnhöfer. 2014. "Partisan politics and privatization in OECD countries." *Comparative Political Studies* 47(9): 1294-1323.

Peev, Evgeni, and Dennis C. Mueller. 2012. "Democracy, economic freedom and growth in transition economies." *Kyklos* 65(3): 371-407.

Pierson, Paul. 1996. "The new politics of the welfare state." *World Politics* 48(2): 143-179.

Pierson, Paul (ed.). 2001. *The new politics of the welfare state*. Oxford: Oxford University Press.

Pitlik, Hans. 2007. "A race to liberalization? Diffusion of economic policy reform among OECD-economies." *Public Choice* 132(1-2): 159-178.

Plümper, Thomas, Vera E. Troeger, and Philip Manow. 2005. "Panel data analysis in comparative politics: Linking method to theory." *European Journal of Political Research* 44(2): 327-354.

Plümper, Thomas, Vera E. Troeger, and Hannes Winner. 2009. "Why is there no race to the bottom in capital taxation?." *International Studies Quarterly* 53(3): 761-786.

Potrafke, Niklas. 2009. "Did globalization restrict partisan politics? An empirical evaluation of social expenditures in a panel of OECD countries." *Public Choice* 140(1-2): 105-124.

Potrafke, Niklas. 2010a. "Does government ideology influence deregulation of product markets? Empirical evidence from OECD countries." *Public Choice* 143(1-2): 135-155.

Potrafke, Niklas. 2010b. "Labor market deregulation and globalization: empirical evidence from OECD countries." *Review of World Economics* 146(3): 545-571.

Potrafke, Niklas. 2013. "Economic freedom and government ideology across the German States." *Regional Studies* 47(3): 433-449.

Potrafke, Niklas. 2015. "The evidence on globalisation." *World Economy* 38(3): 509-552.

Rodrik, Dani. 2011. *The globalization paradox: democracy and the future of the world economy*. Cambridge: Cambridge University Press.

Rueda, David. 2007. *Social Democracy Inside Out: Partisanship and Labor Market Policy in Advanced Industrialized Democracies*. Oxford: Oxford University Press.

Schulze, Günther G., and Heinrich W. Ursprung. 1999. "Globalisation of the Economy and the Nation State." *World Economy* 22(3): 295-352.

Tepe, Markus, and Pieter Vanhuysse. 2009. "Are aging OECD welfare states on the path to gerontocracy?." *Journal of Public Policy* 29(1): 1-28.

Terjesen, Siri, Ruth V. Aguilera, and Ruth Lorenz. 2015. "Legislating a woman's seat on the board: Institutional factors driving gender quotas for boards of directors." *Journal of Business Ethics* 128(2): 233-251.

Tomz, Michael, Jason Wittenberg, and Gary King. 2003. "CLARIFY: Software for interpreting and presenting statistical results." *Journal of Statistical Software* 8(1): 1-30.

Tsebelis, George. 1995. "Decision making in political systems: Veto players in presidentialism, parliamentarism, multicameralism and multipartyism." *British Journal of Political Science* 25(3): 289-325.

Way, Christopher. 2000. "Central banks, partisan politics, and macroeconomic outcomes." *Comparative Political Studies* 33(2): 196-224.

Appendix: Additional tables

Table 4.6: GLS Prais-Winsten regression analysis to explain economic freedom

	1	2	3	4
Government Ideology	-0.27*	-0.31**	-0.25**	-0.29**
	[1.81]	[2.24]	[1.97]	[2.48]
Government Stability		0.16		0.45***
		[1.31]		[3.01]
Veto Player		-0.05		0.14
		[0.01]		[0.05]
Government Change		-0.06		0.15
		[0.22]		[0.56]
EU		0.48		1.74*
		[0.45]		[1.77]
Globalization		0.40***		0.14
		[4.32]		[1.52]
GDP per Capita		0.08		-0.26**
		[0.57]		[1.99]
Unemployment		-0.09		0.01
		[1.09]		[0.09]
Debt		-0.06***		-0.07***
		[3.84]		[4.02]
Lagged Explanatory Variables	No	No	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes
N	459	451	460	451
R-Squared	0.9094	0.9192	0.9092	0.9128

Note: A first order autoregressive process (AR1) accounts for serial correlation. * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. Absolute t-values in brackets.

Table 4.7: OLS regression analyses with *interaction term between government ideology and age of government* to explain first differences in economic freedom

	1	2	3	4	5	6
Interaction Term	0.02	0.02	-0.03	0.04**	0.04***	0.00
	[1.08]	[0.93]	[1.38]	[2.30]	[2.67]	[0.13]
Government Ideology	-0.42**	-0.37**	-0.20	-0.40***	-0.41***	-0.36***
	[2.48]	[2.15]	[1.33]	[2.87]	[2.88]	[2.92]
Age of Government	-0.01	-0.02	0.12**	-0.07	-0.07	0.06
	[0.23]	[0.31]	[2.21]	[1.24]	[1.27]	[1.16]
Government Stability		0.06	0.18*		0.16	0.37***
		[0.47]	[1.75]		[1.26]	[3.04]
Veto Player		-0.82	-1.63		-1.28	-2.44
		[0.38]	[0.92]		[0.53]	[1.06]
Government Change		-0.04	-0.13		0.22	0.01
		[0.15]	[0.51]		[0.73]	[0.02]
EU		0.38	1.94***		0.15	1.77***
		[0.49]	[3.12]		[0.22]	[3.06]
Δ Globalization		0.31**	0.19**		-0.26***	-0.23***
		[2.45]	[2.09]		[2.80]	[2.69]
Δ GDP per Capita		0.16	0.33**		-0.24	0.05
		[1.04]	[2.40]		[1.63]	[0.41]
Δ Unemployment		-0.03	-0.01		0.11	0.07
		[0.31]	[0.06]		[1.03]	[0.78]
Δ Debt		-0.02	0.01		-0.03	-0.02
		[0.61]	[0.24]		[1.30]	[1.25]
Level of Economic Freedom t-1			-0.43***			-0.46***
			[8.70]			[8.55]
Lagged Explanatory Variables	No	No	No	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	411	403	403	412	403	403
R-Squared	0.5992	0.6170	0.7193	0.5945	0.6130	0.7229

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. Absolute t-values in brackets.

Table 4.8: OLS regression analyses with *interaction term between government ideology and government stability* to explain first differences in economic freedom

	1	2	3	4	5	6
Interaction Term	-0.02	-0.04	-0.00	-0.04	-0.04	-0.02
	[0.32]	[0.76]	[0.06]	[0.75]	[0.67]	[0.36]
Government Ideology	-0.15	0.09	-0.32	0.14	0.13	-0.21
	[0.33]	[0.19]	[0.75]	[0.31]	[0.27]	[0.46]
Government Stability	0.08	0.16	0.16	0.25	0.23	0.37**
	[0.40]	[0.80]	[0.93]	[1.19]	[1.09]	[2.01]
Veto Player		-1.27	-1.88		-2.02	-3.03
		[0.59]	[1.06]		[0.83]	[1.35]
Government Change		-0.07	-0.17		0.22	-0.00
		[0.24]	[0.67]		[0.75]	[0.01]
EU		0.38	1.83***		0.09	1.66***
		[0.50]	[2.92]		[0.13]	[2.91]
Δ Globalization		0.32**	0.20**		-0.24***	-0.21**
		[2.58]	[2.18]		[2.63]	[2.47]
Δ GDP per Capita		0.15	0.28**		-0.21	0.04
		[1.03]	[2.11]		[1.45]	[0.27]
Δ Unemployment		-0.04	-0.01		0.12	0.08
		[0.37]	[0.17]		[1.12]	[0.85]
Δ Debt		-0.02	-0.00		-0.03	-0.03*
		[0.58]	[0.11]		[1.39]	[1.80]
Level of Economic Freedom t-1			-0.42***			-0.46***
			[8.57]			[8.73]
Lagged Explanatory Variables	No	No	No	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	423	415	415	424	415	415
R-Squared	0.6028	0.6219	0.7201	0.5985	0.6139	0.7245

Note: * p < 0.10; ** p < 0.05; *** p < 0.01. Absolute t-values in brackets.

Table 4.9: OLS regression analyses with *interaction term between government ideology and veto player* to explain first differences in economic freedom

	1	2	3	4	5	6
Interaction Term	-1.43*	-1.08	-0.34	-1.29	-1.85**	-0.93
	[1.73]	[1.23]	[0.45]	[1.48]	[2.05]	[1.12]
Government Ideology	0.78	0.55	-0.08	0.77	1.22*	0.35
	[1.22]	[0.81]	[0.14]	[1.14]	[1.73]	[0.54]
Government Stability		0.03	0.15		0.11	0.31***
		[0.25]	[1.43]		[0.91]	[2.65]
Veto Player	1.39	1.68	-0.98	2.00	3.19	-0.40
	[0.49]	[0.53]	[0.40]	[0.54]	[0.80]	[0.11]
Government Change		-0.05	-0.17		0.26	0.02
		[0.17]	[0.65]		[0.88]	[0.07]
EU		0.41	1.83***		0.10	1.65***
		[0.54]	[2.91]		[0.15]	[2.90]
Δ Globalization		0.31**	0.20**		-0.25***	-0.22**
		[2.50]	[2.16]		[2.80]	[2.56]
Δ GDP per Capita		0.14	0.28**		-0.23	0.02
		[0.94]	[2.08]		[1.58]	[0.18]
Δ Unemployment		-0.03	-0.01		0.14	0.09
		[0.26]	[0.14]		[1.29]	[0.95]
Δ Debt		-0.01	-0.00		-0.03	-0.03*
		[0.55]	[0.11]		[1.41]	[1.80]
Level of Economic Freedom t-1			-0.42***			-0.46***
			[8.55]			[8.62]
Lagged Explanatory Variables	No	No	No	Yes	Yes	Yes
Year Dummies	Yes	Yes	Yes	Yes	Yes	Yes
Country Dummies	Yes	Yes	Yes	Yes	Yes	Yes
N	423	415	415	424	415	415
R-Squared	0.6057	0.6225	0.7203	0.5991	0.6171	0.7252

Note: * $p < 0.10$; ** $p < 0.05$; *** $p < 0.01$. Absolute t-values in brackets.

Chapter 5

Sources of Franco-German Corporate Support for the Euro: The Effects of Business Network Centrality and Political Connections

Abstract[27]

During the Euro crisis of June 2011, 51 representatives of major French and German corporations launched a political campaign in support of the Euro. This study shows that firm size facilitated high-quality business contacts but that variables of economic interest were not associated with a higher probability of campaign participation when controlling for relational variables. Instead, the empirical analysis suggests that Franco-German business-leaders joined the campaign because 1) their central network position provided them with informational resources to transcend the interest of their firm, and 2) their social and political embeddedness either led to an internalization of pro-Euro values or gave them an incentive to improve their long-term reputation with political decision makers who strongly support the Euro as part of the European integration project. Thus, the directors' corporate and political ties facilitated and motivated corporate political action in support of the Euro.

[27] This chapter is based on my publication "Sources of Franco-German Corporate Support for the Euro: The Effects of Business Network Centrality and Political Connections." *European Union Politics* 14(1): 115-139.

5.1 Introduction

Only a decade after the introduction of the Euro, its future has become uncertain. The advent of the debt crisis in 2010, which spread from Greece through Southern Europe and to Ireland, led to the creation of an institutionalized rescue fund, the European Financial Stability Facility (EFSF), to support Eurozone countries in financial difficulty. Although the former French president, Nicolas Sarkozy, as well as his German counterpart, Chancellor Angela Merkel, publicly declared their determination to preserve the European currency, its long-term sustainability remains uncertain.

The Euro crisis also galvanized the discussion about ambitious reforms of the European Monetary Union (EMU) with proposals ranging from a break-up of the Eurozone or ejecting member states to deeper integration with jointly issued government bonds. These proposals imply far-reaching political and economic consequences, thus intensifying public debates about the benefits and costs of EMU reforms. In this atmosphere, 51 representatives of major French and German companies launched a pro-Euro advertising campaign – "The Euro is necessary" – that was published in several French and German newspapers in June 2011.

Understanding why business leaders participated in this campaign can illuminate, more generally, the phenomenon of collective action by corporate elites. There are two different theories to explain corporate political behavior (Mizruchi 2007). The first, the political economy approach, assumes that the firm's economic interest is the primary factor governing corporate political activity. Consequently, this approach focuses on structural factors such as firm size, industrial sector, and trade activities to predict its specific political interest in the Euro campaign.

In contrast, the social network approach does not deny that business-leaders are self-interested but argues that their behavior is constrained by their social environment. The relationships of managers within the business community and with other socio-political decision makers shape their informational resources and their incentives to engage in political activities. The social network approach would predict that a manager who is well-connected to business and political elites is more likely to join the Euro campaign than a manager of a company with similar firm characteristics but without those relationships.

The first section of this article will briefly review the initial corporate support for the establishment of the EMU and will then present the demands of the Euro campaign. The

next sections will discuss hypotheses that might explain corporate Euro support. Subsequently, the relevance of these hypotheses is tested in a logit regression analysis.

The empirical analysis shows that corporate networks, the award of an Order of Merit, a career in government or politics, and institutional-lobby connections on the EU level are associated with a higher probability of campaign participation. Firm size correlates positively with these relational variables but is not a direct predictor of EMU support, whereas the other political economy variables do not seem to play a significant role. Thus, Franco-German business leaders may have decided to participate in the pro-Euro campaign because 1) their central network position provided them with informational resources that allowed them to transcend the interest of the individual firm, and because 2) their social and political environment either led to an internalization of pro-European values, or gave them an incentive to improve their long-term reputation with political decision-makers who strongly support the Euro as part of the European integration project.

5.2 Corporate interest in the establishment of EMU

Transnational corporations have been involved in the European integration process through business associations such as the European Round Table of Industrialists (ERT). The ERT consists of chief executive officers (CEOs) of the largest European firms and has been influential in the agenda setting and implementation of the common market for goods and capital (Apeldoorn 2001: 77-8). The ERT did not play a major role in establishing the EMU as it regarded this issue to be secondary to the completion of the internal market. However, the Association for Monetary Union in Europe (AMUE), another transnational corporate group with about 400 members, actively lobbied in favor of the Euro and had several personal ties to the ERT (Apeldoorn 2001: 80-1; Collignon and Schwarzer 2003: 3).

General business support for EMU differed quite substantially between France and Germany. From 1988 onwards, French business support was among the highest in Europe, involving between 80 and 90 percent of the interviewed managers, while only 60 percent of German executives supported EMU in 1988 – the lowest level of support in Europe. German support increased after the strong appreciation of the D-Mark in 1995 but German business directors differed from the French in their expectation of future monetary policy: While German support was conditional on the continuation of the Bundesbank's low-inflation policy, French businesses expected more political control over

the European Central Bank (ECB) and an easier monetary policy (de Boissieu and Pisani-Ferry 1998: 76-83; Moravcsik 1998: 391-412; Verdun 2000: 167-9).

Table 5.1: Elite support for EMU

	France	Germany	EU 15
Politicians	5.2	5.7	5.5
Civil Servants	7.0	7.2	6.4
Media	6.9	5.8	5.6
Culture/Intellectuals	6.6	5.5	5.8
Business Leaders	7.5	7.0	6.2
Elite Overall	90%	90%	85%
General Public	58%	40%	53%
Positive Effects			
Less transaction costs	91%	89%	91%
Cut down business costs	85%	85%	85%
Reduce turmoil in markets	77%	74%	75%
Faster economic growth	51%	64%	56%
More jobs	35%	44%	41%
Negative effects			
Lose control of economic policy	42%	27%	39%
Higher inflation	8%	38%	20%
Loss of national identity	20%	8%	16%

Note: The first five rows show the mean support for EMU based on a scale that ranges from +10 (very much for) to -10 (very much against). All other rows show the percentage of responses which ranges from "somewhat" (+5) to "very much" (+10) (Spence 1997).

Table 5.1 shows the attitudes of elites in France, Germany, and the European Union (EU) toward the EMU in 1996 (Spence 1997). On a scale of -10 (very much against) to +10 (very much for), business leaders in France (7.5) and Germany (7.0) strongly supported the Euro project on average. Politicians, civil servants, the media, and intellectuals also supported the Euro nearly unanimously. However, throughout Europe the general public was much less supportive, especially in Germany, where public support for the Euro (40 percent) was the lowest in the EU.

French and German decision makers expected similar benefits from the introduction of the Euro. However, they were concerned about quite different potential negative effects: French elites tended to fear the loss of national identity and control over economic policies; their German counterparts were mostly concerned about higher inflation rates.

5.3 The advent of the Euro crisis and the campaign "The Euro is necessary"

The advent of the debt crisis in 2010 led to the establishment of the EFSF, through which solvent Eurozone countries guaranteed the loans of highly indebted members. The ECB also began buying government bonds, thus infringing on its independence (Marsh 2011: 255).

Against this political background, "The Euro is necessary" newspaper campaign sprung into existence. It called for unity among Eurozone members instead of, for example, evicting members or breaking up the Eurozone entirely. It thus favored supporting indebted countries, even if "the return to stable financial relations will cost many billions of euros," since "the European Union and our common currency are always worth this effort." And it argued for tougher budgetary rules and institutional reforms in favor of more European integration (FAZ 2011).

The campaign can be classified as an influence strategy to shift public and elite opinion toward a favorable view of the Euro (Beyers 2004: 213-6). Its significance stems from its fit with the agenda of the French and German governments just when public opinion in both countries was becoming more skeptical about the wisdom of maintaining a common currency. Since political beliefs depend to a great extent on social proof and elite influence (Kuran 1997: 157-75), this pro-Euro campaign might have increased the public legitimacy of the EMU.

5.4 Theoretical explanations

Since Olson (1965), the study of corporate political action has generally been understood as a collective action problem. Firms might be able to reach a collective good through political participation that is beneficial for the overall business community (e.g., lower corporate taxes). But if a firm's contribution is unlikely to affect the overall provision of the collective good, the firm would maximize its profits if it does not participate and free ride on the endeavors of other companies.

However, collective action analysis would not take us far in understanding this campaign, because the monetary benefits from free riding were minuscule: the initiators paid a large portion of the campaign (Büschemann 2011). Moreover, the ad concluded with the names of its supporters, thus making it possible to identify non-participants.

Two different approaches – based on political economy and social network analysis – might explain the participation of Franco-German business directors in this campaign. These theories are not necessarily mutually exclusive (Mizruchi 2007). Both highlight the objective opportunities and constraints of agents in their decision-making process, and they are compatible with the rationality assumption according to which agents aim to maximize their utility. However, political economy assumes exogenous and constant preferences whereas preferences are endogenous to the process of social interaction in network analysis (Mizruchi 1994: 335). This difference in the analysis of preference formation leads to distinct hypotheses about corporate political behavior which are elucidated below.

5.4.1 The political economy approach

In the political economy approach, corporate political activity is seen to be essential in influencing economic policies in favor of business interests. The assumptions of this approach are derived from neoclassical microeconomics, according to which firms are assumed to be unitary rational agents and profit maximizers (Hillman et al. 2004: 839; Weingast and Wittman 2008: 3).

The benchmark of this approach is Stigler's (1971) theory of regulatory capture. Since governments have the resources to coercively implement regulation with far-reaching economic consequences, firms have an incentive to lobby for regulatory policies that would increase their profits. The theory of regulatory capture has itself captured several research areas within political economy, such as international trade theory in which firms are supposed to demand trade policies according to their profit expectations (Hart 2004: 54).

We can thus formulate the first hypothesis regarding the pro-Euro campaign:

H1: *Firms that would benefit from the policy prescriptions of the pro-Euro campaign were more willing to support this appeal.*

Different currency regimes affect corporations in different ways, creating advantages for some groups and disadvantages for others (Milner and Keohane 1996: 4-5). Broz and Frieden (2001) argue that businesses that are strongly involved in intra-currency union trade favor a common currency because it reduces transaction cost through the eradication of exchange rate risks. In contrast, businesses that operate mostly in the domestic economy should oppose a currency union, as they would face stronger internal market competition. Frieden (2002) uses aggregate data to show that European countries tended to fix their exchange rate to the D-Mark more strongly than other firms if they had higher trade volumes with Germany and the Benelux states. Duckenfield and Aspinwall (2010)

employ survey data to show that British companies tend to prefer EMU membership if they trade heavily with the Eurozone. Broz and Frieden's (2001) argument might also apply to the maintenance of EMU since the break-up of the Eurozone or the eviction of members would cause a return of exchange rate risks.

H2: *Firms that are heavily involved in intra-European trade were more willing to support the pro-Euro campaign.*

Broz and Frieden (2001) argue that the tradable sector benefits from currency depreciation because its export products become more competitive whereas consumers and non-tradable industries prefer currency appreciation. This logic might be the driving force behind the pro-Euro campaign since its support for highly indebted Euro area countries is associated with a depreciation of the Euro. Moreover, as shown above, the independence of the ECB was decisively constrained; hence campaign supporters might also expect a looser monetary policy in the long term, which benefits exporters. These incentives give raise to the third hypothesis:

H3: *Firms of the tradable sectors were more likely to join the pro-Euro campaign.*

Scholars have also argued that firm size is critical to explaining political activity because larger firms have the economic resources to gain the attention of policy makers (Andres 1985; Grier et al. 1994; Mitchell et al. 1997; Schuler and Rehbein 1997; Hansen and Mitchell 2000). They are also more likely to have a bigger stake involved in a policy issue, leading to the fourth hypothesis:

H4: *Firm size is positively associated with willingness to join the pro-Euro campaign.*

5.4.2 The social network approach

The political economy approach predicts that it is unlikely that firms would form alliances, since different sectors often have opposing interests. Indeed, business unity is rare; "most of the time, there simply is no such thing as 'business'" (Hart 2004: 49). It is thus extraordinary that the pro-Euro campaign unified 51 directors of the largest French and German firms. Social network scholars (e. g., Granovetter 1985; Knoke 1990; Emirbayer 1997) argue that the process of consensus formation in social networks can facilitate such corporate political unity and attenuate the free-rider incentive.

The examination of interlocking directorates has become a common approach in social network analysis to study corporate behavior. According to Pfeffer and Salancik (1978), resource dependency is a major reason for corporations to form interlocks. Interlocking

directorates reduce environmental uncertainty and information asymmetry since they provide companies with access to external knowledge and resources (Mizruchi 1996: 274-6).

Mizruchi (1982, 1996: 280-3) shows that interlocking directorates between large firms have been a major characteristic of markets in Western countries since the early twentieth century. French and German business communities consist of a small core network of interconnected managers (Yeo et al. 2003; Höpner and Krempel 2004; Milakovic et al. 2010). Moreover, comparative studies reveal that the density of corporate networks is larger in coordinated market economies, such as in France or Germany, than in liberal market economies, such as the UK or USA (Stokman et al. 1985; Santella et al. 2009; van Veen and Kratzer 2011).

But as Mizruchi (1996: 280) points out, board interlocks are worth studying, only if they have consequences for corporate political behavior. Mizruchi (1992) finds a positive association between connected companies and the similarity of election campaign contributions. Burris (2005) shows that managers were more likely to contribute to the same candidate if they shared inter-corporate ties.

Social network analysis explains the diffusion of attitudes or behavior through interaction. Social ties facilitate the transmission of information through mutual communication, and the adoption of a meme (e. g., an idea, behavior, or value) depends upon the proportion of surrounding nodes that propagate this meme. Further, the length of the path that a meme needs to travel in the network in order to reach an agent determines the duration of the meme adoption (Borgatti and Foster 2003: 1005). Hence, adoption is a result of cohesion through socialization between neighboring ties. The idea of "structural equivalence," where diffusion occurs through competition between connected agents, predicts the same outcome. For example, company A lobbies the government to avoid losing influence after noticing that company B has engaged in lobbying (Burt 1987).

The concept of meme diffusion also applies to corporate networks in which multiple directorates allow managers not only to receive information from executives with whom they share a direct tie, but also give them access to the experiences of remote executives through the spread of information across the network structure (Burris 2005: 275-6; Alfarano and Milakovic 2009). Michael Useem (1984: 56) describes interlocks as "transcendent network" in which executives have access to the collective wisdom of major sectors of the economy. Consequently, it is the location within the business network that

determines the amount of information an executive receives about the practices and concerns of corporations. Given that business networks tend to consist of an inner circle of well-connected executives, Useem (1984: 57) argues in his theory of "the inner circle" that business directors at the network's center follow a political strategy that is more sensitive to the general interest of the business community compared to managers at the periphery.

Previous research (Burris 2005: 260) shows that executives of the inner circle are more likely to achieve leading positions in international, national, or sector-specific business associations. They are also more likely to become members of the governance boards of non-profit organizations, political foundations, and think tanks. Since central executives tend to have a better understanding of the general corporate interest, they are an adequate choice to represent the business class in the political sphere (Useem 1984: 108-11). Like ties across corporate boards of directors, these extra-corporate networks should also have a positive impact on cohesive political action, since they provide additional ties between corporate executives.

In combination, the social network approach and the theory of the inner circle lead to the following hypothesis:

H5: *A central position of an executive in corporate and extra-corporate networks was associated with similar political action in the pro-Euro campaign.*

While business network analysis studies how corporate preferences diffuse across the business community, it does not provide a unique explanation for the initial perception of corporate interest (Mizruchi 1994: 336). Useem (1984: 108-15) claims that the inner circle is more pragmatic and consensus-oriented in politics, as it pays more attention to the legitimacy of the economic system. However, several studies that evaluated the ideology of the inner circle in the U.S. found contrary results. Whether inner-circle members exhibit conservative or liberal ideology depends on the time of observation, the model, and the sample specifications (Burris 2009).

The origins of perceptions of business interests are not typically explored in the political economy literature, probably because preference formation is often assumed to be an easy epistemological task for corporations. However, corporations often mis-specify their

interests, and pursue strategies that fail to make them better off (Krueger 1990; North 1990).[28]

This does not imply that business leaders are irrational, but that they often operate in a world of uncertainty where causes are invisible and events are mostly non-repeating and unpredictable, regardless of the amount of information collected about the past.[29] Hence, the perception of corporate political interest depends on political ideologies that simplify the complexity of the social environment. The origins and circulation of ideologies are essentially driven by elites (Zaller 1992). Converse (2006: 64) argues that "the broad contours of elite decisions over time can depend in a vital way upon currents in what is loosely called 'the history of ideas.'" Their evolution and the dynamics of ideological adoption have been under-studied, probably because of the difficulty of quantifying the influence of ideologues on political decision-making (Friedman 2009; Schmidt 2008: 308-9; Zaller 2009: 78).

There are at least two mechanisms that might explain how ideologies shape corporate political activities through social and political connections:

(a) Managers' non-business networks might shape their ideological positions. Business directors might be more likely to adopt certain political beliefs the more often they interact in social circles that share those ideas. Bond (2004, 2007) and Bond et al. (2010) show that British business directors were more likely to donate to the Conservative Party and to participate in a political campaign if they had attended elite universities and were members of social clubs.[30]

(b) Belief adoption can also be caused through preference falsification, where people publicly support beliefs that differ from what they privately think is true (Kuran 1997). Depending on the feedback mechanism of his social circle, a manager might have an incentive to engage in preference falsification if he expects to benefit from it via improved career prospects or a better reputation.

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[28] In a long-term study that lasted over two decades, Philip E. Tetlock (2005) illustrates the difficulty of accurately forecasting political or economic developments. Tetlock shows that not only do the predictions of political experts perform only slightly better than randomness, but that they are outperformed by simple computer extrapolations.

[29] See Taleb and Pilpel (2004) or Blyth (2006, 2009) for a detailed discussion of the differences between risk and uncertainty and its relevance for political science.

[30] These formed identities can have negative consequences for the firm's interest. As Bond (2007: 82) argues, business directors kept supporting the Conservative Party even though electoral success of Labour was likely, thereby alienating the new Labour government.

Since the Franco-German leadership strongly supported the Euro as part of the European integration project, embeddedness of CEOs in these elite networks might be associated with support for the Euro either through value internalization or preference falsification.

H6: *French and German executives were more likely to support the pro-Euro campaign, the more often they interacted with social and political elites that share a pro-Euro ideology.*

The adoption of a certain ideology could also depend on the extent to which a firm participates in, or is affected by, politics. According to Hillman and Hitt (1999: 828-9), corporations can either choose a transactional or a relational approach to political activity. The transactional approach is a short-term strategy and a reactive corporate response to a public issue that has become salient, while the relational approach is a long-term investment in relationships with political decision makers. Which strategy is the optimal choice for a firm depends on the characteristics of the political system: The literature outlines that the institutional environment in coordinated market economies is more conducive to developing long-term relationships because such systems emphasize cooperation among institutionalized bargaining partners. In contrast, in a pluralist system, which consists of several competing interest groups, a transactional approach to political activity might be more fruitful (Hillman 2003; Hillman and Hitt 1999: 830; Wilts 2006: 443-4).

Cowles (2001) shows that corporations moved their political strategy towards a relational approach on the EU-level in response to the enactment of the Single European Act of 1986 and the increasing transfer of competency to Brussels. With relational business-government interactions, corporations have to provide governments with informational goods in order to gain political access. Moreover, they need a credible reputation in order to establish good working conditions with EU government officials (Bouwen 2002: 376).

A firm's long-term political relationships can be seen as its political capital. Business directors may try to increase their political capital by demonstrating ideological affinity with the goals of important government officials. Woll (2008) shows that, in the EU and in the U.S., the change in the trade-policy preferences of telecommunication and air transport corporations, which went from promoting protectionism to demanding open markets, was endogenous to the political process: The adoption of pro-market ideas allowed these corporations to foster access to governments. Similarly, American Express supported the deregulation of trade in services in the U.S., although this issue was not very important to the firm, because it fit the ideological agenda of key politicians, which

in turn gave American Express access to political decision makers on a wider range of issues (Yoffie and Bergenstein 1985: 131).

Therefore, CEOs might have joined the "Euro is necessary" campaign to improve their corporate political capital with pro-Euro government officials.

H7: *French and German executives were more likely to support the pro-Euro campaign the more their corporation depends on good working conditions with EU government officials.*

5.5 Data and methods

The boundary specification of cases for a sample is a crucial task since biased case selection can lead to a wrong inference. The social network literature distinguishes between two standard inclusion rules (Laumann et al. 1983; Knoke and Yang 2008: 15-7): While boundary specification is based on the subjective perception of agents in the realist approach, the researcher defines the boundaries according to a conceptual framework in the nominalist approach. For the purpose of this study, the sample should include all companies that were aware of this campaign and decided to join or to abstain from it. The positive cases are the 51 executives of 49 corporations who signed the pro-Euro campaign pledge. This list includes 29 large-caps (traded on CAC 40 or DAX 30), twelve mid-caps, seven privately owned firms and one state enterprise.

Detecting the negative cases is less straightforward and requires background information about the origins of the campaign. According to the initiators, the campaign was an outcome of the annual Franco-German meeting in Évian, where CEOs, academics, and politicians discuss current issues and topics related to Franco-German relations and European integration. The group of meeting organizers consists of different French and German firms that invite CEOs who might be interested in the annual agenda. However, as the list of invited companies and the list of executives who knew about this campaign are not publicly available, I had to rely on a nominalist strategy. Besides the supporters of the campaign, this sample consists of the CEOs of all other large-cap and mid-cap corporations of the CAC 40, CAC Next 20, DAX 30, and M-DAX 50, with an overall sample size of 156.

There were four reasons for choosing this boundary specification: First, particular firms are not purposively chosen by the researcher but by means of independently compiled indices based on market capitalization. Second, this selection criterion seems to be reasonable because invitations to the Évian meeting are restricted to large companies. The

smallest non-financial company that joined the campaign had annual revenues of 315 million Euro and about 1,900 employees; it seems unlikely that much smaller companies had an opportunity to participate. Third, the invitation procedure of the Évian meetings suggests that large companies with an interest in the future of the Eurozone probably received an invitation to participate, given the assumption that the organizers developed a sufficient understanding of this matter from previous meetings and responses to previous invitations. Fourth, there is also some evidence that the business community was generally aware of the formation of the campaign. The Federation of German Industry (BDI) announced the date of the meeting in a public publication (BDI 2011). The former BDI president, Hans-Olaf Henkel (2011), knew in advance about the campaign from another non-participant and published a critique shortly after the campaign launch in a German business newspaper.[31]

The study consists of the following set of variables: The binary dependent variable indicates if an executive signed the pro-Euro campaign. Previous research suggests that stock returns following political events could be an adequate proxy for changes in the profitability of firms (e. g., Fisman 2001; Bechtel and Schneider 2010). Moreover, the European Council implemented measures on July 21, 2011 that come close to the demands of the pro-Euro campaign: Greece remained in the Euro-zone and received an additional €109 billion, the autonomy of the EFSF to intervene on the bond market was increased, loan periods were extended, interest rates were cut, and the country leaders pledged for budget consolidations.

Consequently, I used the returns of a firm's stock during the decision-making process of the Euro bailout program to estimate the firm's economic interest to join the pro-Euro campaign. The period of measurement ranged from the end price on July 19 to the starting price on July 22 because it was announced on July 19 that Sarkozy would meet Merkel and ECB president Jean-Claude Trichet in Berlin on the following day to find a common strategy for the European Council. The results of the European Council meeting were announced in the late evening of July 21 and stock prices should have adjusted to this development by the morning of July 22.[32]

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[31] I obtained information about the Évian meetings through interviews with Hans-Olaf Henkel and representatives of the BDI, Allianz SE, and ThyssenKrupp AG.

[32] For calculating the explanatory variable "stock return," the equation is

$$r_i = \ln(S_t) - \ln(S_{t-1}) * 100$$

where S_t is the starting price on July 22 and S_{t-1} is the end price on July 19.

The variable "European Sales" measures European sales as a proportion of overall sales in 2010. Since European countries that are not EMU members tend to adopt the monetary policy of the ECB (Plümper and Troeger 2006), a distinction between Eurozone and the rest of Europe might be negligible; especially since nearly all Franco-German companies do not distinguish between the two in their corporate governance reports.

I added a dummy variable for firms that engage in the tradable sector, following the definition of Gregorio et al. (1994), who rely on empirical data from OECD countries for their classification. Industries are defined as tradables if they export at least 10 percent of their domestic production. Following this cut-off point, all manufacturing industries, consumer goods, agriculture, basic materials, technology and transportation are defined as tradables, and business and financial services, construction and utilities are non-tradables.

Some studies use the number of employees or the size of assets as indicators of firm size, but these definitions would introduce a bias either in favor of labor- or capital-intensive businesses. This study utilizes market capitalization in billion Euros because this concept is routinely used in finance for publicly traded corporations.

While all these explanatory variables are based on firm attributes, the variables relevant for the network hypotheses focus on the relationships of the individual executive. A corporate tie exists if two executives are members of the same board of directors. This can either be on the board of one of their companies or on the board of a third company. An extra-corporate tie exists if two executives are members of the same governance board of an organization, regardless of the organizational purpose.

The analysis of these networks requires a concept of centrality because the fifth hypothesis states that a prominent network position is key for political action. There are four standard concepts in network analysis to identify the centrality of an agent in a network: degree centrality, betweenness centrality, closeness centrality, and eigenvector centrality (Hanneman and Riddle 2005). Degree centrality measures the number of ties of an agent but this might only be a local measurement since it does not consider the impact of neighboring ties. In contrast, the betweenness and closeness centrality concepts are based on the idea of shortest-path distances. High betweenness centrality indicates that an agent connects relatively many short distance paths of other agents and high closeness centrality indicates that the average distance of an agent to all others is small (Brandes and Pich 2007: 2304-6). Eigenvector centrality is a sophisticated extension of degree centrality. It also includes the quantity of ties of an agent and, additionally, it weighs those connections

according to the centrality of the adjacent neighbors in the overall network. Hence, an agent is central if he has many ties to well-connected nodes.

Eigenvector centrality allows for weighted ties if there is more than one tie between agents. It is supposed to be a relatively better tool to measure the overall structure of a network (Hanneman and Riddle 2005). Furthermore, it assumes a simultaneous network flow, which is a suitable measurement for influence-type processes whereas shortest-path concepts assume constrained paths and are more suitable for analyzing flows between adjacent nodes (Borgatti 2005: 61-2).

These characteristics make eigenvector centrality preferable to other centrality concepts since we are interested in the influence process across the entire network and would like to take weighted ties between agents and high-quality contacts into account, as suggested by Useem's inner-circle theory. Thus, the CEO network variables are based on eigenvector centrality, which is calculated by UCINET 6 and can vary between 0 and 100 percent, whereby a higher score indicates a higher degree of centrality (Borgatti et al. 2002).[33]

Figure 5.1 reveals that the distribution of centrality scores for corporate and extra-corporate networks of business directors is very positively skewed. The fact that they are also very positively correlated (0.60) confirms the findings of previous research on French and German capitalism, namely that only a small proportion of directors is well-connected and possesses a central position in the business network.

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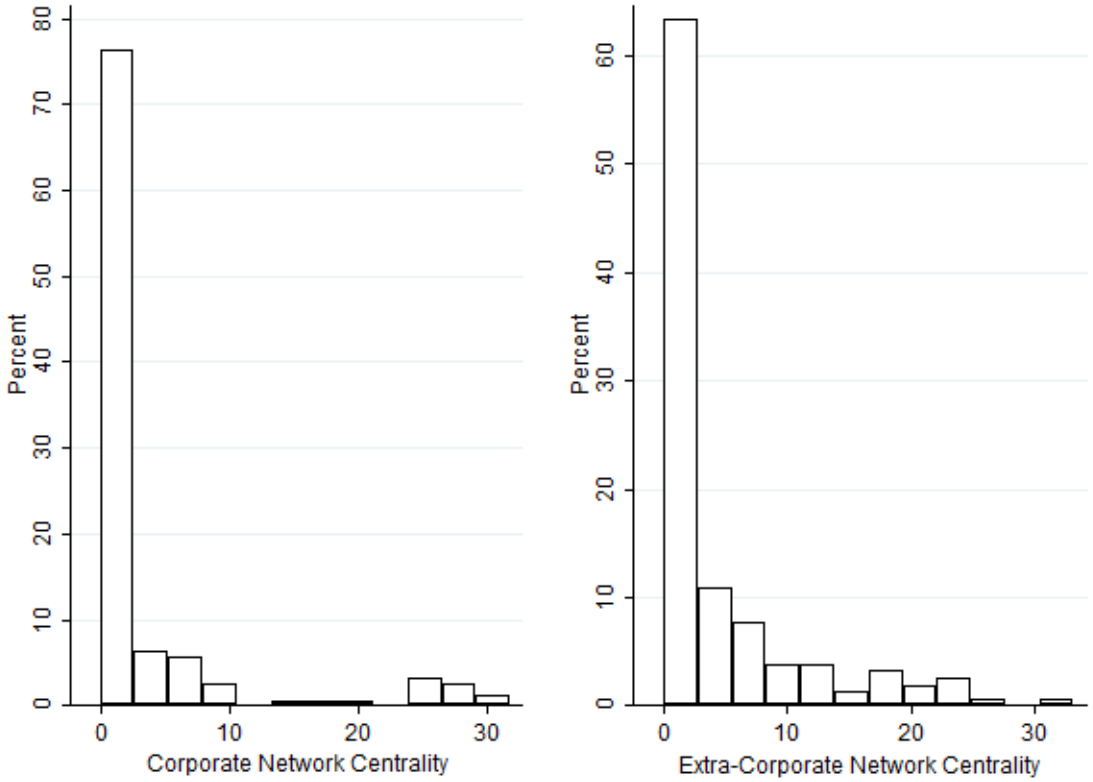
[33] The eigenvector centrality scores are obtained in the following way (Newman 2008):

$$x_i = \frac{1}{\lambda} \sum_{j \in M(i)} x_j = \frac{1}{\lambda} \sum_{j=1}^{N=156} a_{i,j} x_j$$

where x_i is the centrality score of executive i, λ is the eigenvalue, M(i) is the set of executives that are connected to executive i, x_j the centrality score of executive j, N is the total number of executives in the network, and $a_{i,j}$ is the adjacency matrix of the network, which represents the quantity of ties between executive i and j. This notation can be redefined as eigenvector equation where v is the eigenvector:

$$\lambda v = a_{i,j} v$$

Figure 5.1: Distribution of CEO network centrality



I created two variables to measure the network connections of managers to social and political elites which are relevant for the sixth hypothesis. First, the bestowal of an Order of Merit like the *Ordre national de la Légion d'honneur* in France and the *Bundesverdienstkreuz* or *Landesverdienstorden* in Germany is used as a proxy for the degree to which a manager is socially embedded. Such an award indicates high social standing and national reputation. Second, a measurement for political embeddedness is the previous career path of business directors in government or politics (Faccio et al. 2006). The dummy variable "Political Career" indicates whether a director has been a politician, a senior civil servant in the national government, a member of a government commission, or if he achieved a leading position within political party organizations.

The variable "EU Lobby Organization" is relevant for the seventh hypothesis and uses the EU interest-group population dataset to measure whether a corporation has a lobby organization on the EU level (Wonka et al. 2010). Such an institution might allow business leaders to interact more frequently with European decision makers. Moreover, this is a relevant measurement of institutional political embeddedness because corporations

that have established institutional lobby resources might have a stronger incentive to improve their relations with government officials. As Hillman and Hitt (1999: 829) maintain, "the existence of these offices (given the expense of having full-time representation in these areas) implies that some firms are regularly concerned with government relations."

However, identifying any causal inference from the defined five relational variables might be difficult because unmeasured factors could affect network membership as well as the propensity to join the pro-Euro campaign.[34] Borgatti and Halgin (2011: 1178) identify two problems for network analysis and for empirical enquiries in general. These are the problems of endogeneity (whether X causes Y, or the other way around) and omitted variable bias (Z causes X and Y).

A solution for endogeneity is to construct a model which converts a set of inputs at time T to an output at T+1 (Borgatti and Halgin 2011: 1177-8). Consequently, the time of analysis for the relational variables is May 31, 2011 before the campaign was launched.

The analysis includes four additional control variables to reduce potential bias caused by omitted variables. These variables were chosen because, theoretically, they might influence the dependent variable and might also correlate with one or more of the explanatory variables. A dummy variable for French-based businesses is included to control for unobserved country-specific effects. Since French corporations were more supportive than German corporations of a more active monetary policy, one could also expect that French executives had a greater propensity to join the Euro campaign.

The variable "government ownership" measures the percentage of shares directly or indirectly owned by the French or German states. Dinç (2005) shows that government ownership has an impact on corporate policies and it might be possible that such influence existed for the campaign as well. Moreover, this variable might correlate with relational variables as government-owned corporations might prefer CEOs with previous political careers.

In addition to their own corporate and extra-corporate networks, CEOs could also utilize the interlocking directorates of the other officers and directors of their firm to gain

[34] Rogowski and Sinclair (2012) suggest applying an instrumental variables approach to account for network membership selection but it was not possible to detect an instrument which correlates with these explanatory variables and is clearly exogenous to the dependent variable.

informational resources. The variable "Firm Network Centrality" measures the direct ties between the corporations of the sample and is based on eigenvector centrality.

The last control variable is the age of the business leader. Ceteris paribus, older directors have a greater professional experience, a proven track record, and had more opportunities to develop business and political relationships (McKnight and Tomkins 2004). Thus, director's age might be a key determinant of relational variables such as multiple board membership in corporations and other organizations

The data for all variables are drawn from the business databases BusinessWeek, OneSource, and Worldscope, and the home pages of the relevant corporations and organizations.

Since the dependent variable is dichotomous, this analysis is based on logit regression analysis, which means that the coefficients do not show directly how strongly they affect the dependent variable. Utilizing King et al.'s (2000) simulation-based approach, I obtain the substantial impact of the explanatory variables by reporting changes in predicted probabilities of the dependent variable when one or more explanatory variables are changed. For this purpose, I used the Stata program *Clarify* to calculate 1,000 sets of simulated parameters from the logit model to take estimation uncertainty into account when calculating confidence intervals for the first-difference effects (Tomz et al. 2003).

Ten directors would have been excluded from the analysis because their companies were not publicly traded and consequently had no data for returns and market capitalization. Hence, the particular values are imputed with data of comparable national and Eurozone companies with similar characteristics in terms of sector activity, assets, employees, and revenue.

Table 5.2 shows the descriptive statistics for the variables of interest, which consist of the range, standard deviation, overall mean, and a difference of means test for campaign supporters and abstainers. Stock returns increased, on average, by 3.21 percent but the t-test indicates that there were no significant differences between campaign supporters (3.17) and other companies (3.22).[35]

[35] Since this study is based on large, publicly traded companies, this does not imply that other groups, such as small enterprises or the taxpayers, have also benefitted or that the national economies as a whole were better off.

5.6 Empirical analysis

Table 5.2: Descriptive statistics for variables of interest

Variable	Min	Max	Mean (Sd)	Mean by Campaign Support		T-Statistic (p-value)
				Yes	No	
H1: Stock Returns	-6.53	21.10	3.21	3.17	3.22	-0.08
			(3.62)	(2.85)	(3.96)	(0.94)
H2: European Sales	12.9	100	64.95	60.05	67.32	-1.91
			(22.46)	(20.70)	(22.99)	(0.06)
H3: Tradable Industry	0	1	0.60	0.63	0.58	0.55
			(0.49)	(0.49)	(0.50)	(0.58)
H4: Firm Size	0.13	89.69	14.42	22.59	10.45	4.14
			(18.05)	(22.97)	(13.54)	(0.00)
H5a: CEO Corporate Network Centrality	0	31.62	3.36	8.09	1.07	6.31
			(7.29)	(10.54)	(3.09)	(0.00)
H5b: CEO Extra-Corporate Network Centrality	0	33.20	4.25	8.23	2.31	5.57
			(6.81)	(8.71)	(4.58)	(0.00)
H6a: Order of Merit	0	1	0.41	0.71	0.27	5.72
			(0.49)	(0.46)	(0.44)	(0.00)
H6b: Political Career	0	1	0.23	0.39	0.15	3.44
			(0.42)	(0.49)	(0.36)	(0.00)
H7: EU Lobby Organization	0	1	0.32	0.57	0.20	4.95
			(0.47)	(0.50)	(0.40)	(0.00)
C1: French-Based	0	1	0.44	0.57	0.37	2.36
			(0.50)	(0.50)	(0.49)	(0.02)
C2: Government Ownership	0	100	5.05	7.58	3.83	1.46
			(15.10)	(19.55)	(12.30)	(0.15)
C3: Firm Network	0	40.58	4.77	7.17	3.60	3.35
			(6.46)	(7.75)	(5.39)	(0.00)
C4: Age of Director	43	74	56.63	58.10	55.91	2.03
			(6.36)	(7.55)	(5.60)	(0.04)

Note: First line gives the mean value, the second line the standard deviation in brackets.

There is a significant positive difference between campaign supporters and other companies as suggested by hypotheses 4-7: pro-Euro campaigners had a larger firm size and tended to be more central in corporate and extra-corporate networks. They were also more likely to have received an Order of Merit, worked in government positions, and their corporations were more likely to have a lobby organization on the EU level. Additionally, French and older CEOs as well as executives of corporations with greater network centrality had a stronger propensity to join the campaign. However, only a statistical analysis in a multiple framework, as shown in Table 5.3, permits one to determine which of the

explanatory variables is actually capable of explaining support for the pro-Euro campaign while controlling for other factors.

Model 1 includes all explanatory variables that are relevant for the hypotheses of the political economy approach. Contrary to hypothesis 2, intra-European sales are negatively associated with Euro support with a slightly significant value. Firm size turns out to be strongly significant; it is positively associated with a higher likelihood to participate in the campaign.

The Models 2 and 3 add the relational and control variables to the analysis. All five relational variables turn out to be significant: CEO corporate and extra-corporate network centralities, the award of an Order of Merit, a career in government or politics, and the existence of an EU lobby organization significantly predict a higher propensity to join the pro-Euro appeal. In these frameworks, there is a U-shaped relationship between director's age and campaign support. Firm size becomes insignificant, indicating that firm size could facilitate the presence of these four variables but is not a direct predictor of EMU support.[36]

Column 4 shows the estimates for the substantial impact of the last model if a particular continuous variable is changed from its mean to one standard deviation above, or if a categorical variable moves along its two categories while keeping all other explanatory variables at their mean. For instance, increasing corporate network centrality from its mean to one standard deviation above predicts a 22.1 percent higher probability to be part of the pro-Euro campaign.

In addition to the results of column 4, performing this simulation for both CEO networks in combination yields a 40.1 percent higher likelihood. Furthermore, including the social- and political-embeddedness dummies in this first-difference effect increases the probability to about 86 percent.

These results allow us to evaluate each of the seven hypotheses. There was not any evidence for the first three political economy hypotheses. The coefficients for stock returns and tradable sector were not statistically significant in any model specification. European sale proportion even turned out to be statistically negative in the first model.

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[36] Firm size correlates 0.38 with corporate network centrality, 0.35 with extra-corporate network centrality, 0.21 with Order of Merit, and 0.43 with EU lobby organization. These relationships are significant at the 95 percent confidence level. The correlation between firm size and political career is 0.07 and is not significant.

Table 5.3: Logit regression analyses to explain corporate support for the pro-Euro campaign

Explanatory Variables	**Support for Pro-Euro Campaign**			
	1	**2**	**3**	ΔX_i
H1: Stock Returns	-0.01	-0.04	-0.06	-3.0%
	(0.06)	(0.08)	(0.08)	[-9.9, 4.4]
H2: European Sales	-0.02*	-0.01	-0.01	-4.2%
	(0.01)	(0.01)	(0.01)	[-10.8, 3.5]
H3: Tradable Industry	-0.27	0.04	0.23	4.2%
	(0.44)	(0.56)	(0.62)	[-13.5, 20.9]
H4: Firm Size	0.04***	-0.00	-0.01	-2.9%
	(0.01)	(0.01)	(0.02)	[-9.5, 4.7]
H5a: CEO Corporate Network Centrality		0.11**	0.14***	22.1%
		(0.05)	(0.05)	[6.8, 38.2]
H5b: CEO Extra-Corporate Network Centrality		0.07*	0.12**	16.3%
		(0.04)	(0.05)	[3.2, 29.8]
H6a: Order of Merit		1.65***	1.64***	29.9%
		(0.52)	(0.60)	[12.1, 47.8]
H6b: Political Career		0.99*	1.19*	24.1%
		(0.55)	(0.67)	[1.8, 48.4]
H7: EU Lobby Organization		1.07**	0.98*	18.7%
		(0.50)	(0.55)	[1.2, 35.7]
C1: France-Based			0.95	16.8%
			(0.78)	[-7.3, 40.1]
C2: Government Ownership			-0.01	-1.5%
			(0.02)	[-6.9, 4.9]
C3: Firm Network			0.02	9.5%
			(0.05)	[-11.4, 38.7]
C4: Age of Director			-1.43***	
			(0.55)	
C4: Age of Director – squared			0.01**	
			(0.00)	
N	156	156	156	
Log Likelihood	-89.64	-61.98	-56.55	
AIC	189.27	143.96	143.11	
BIC	204.52	174.46	188.86	
Pseudo R^2	0.09	0.37	0.43	

Note: * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. Standard errors are in parentheses in the first three models. The analysis of the substantial impact in column 4 is based on Model 3. The particular explanatory variable is changed while keeping all other variables constant at their mean. Continuous variables are changed from their mean to one standard deviation above. Categorical variables are changed along their two categories. 90% confidence interval in parentheses.

The fourth hypothesis predicts a relationship between firm size and political action. Firm size does not appear to be statistically significant in a multiple framework but it correlates positively with the measures of CEO network centrality, an Order of Merit, and EU lobby organization, indicating that it might be associated with the managers' high-quality relationships.

The empirical analysis shows that a prominent position in business and extra-business networks, the award of an Order of Merit, a career in government or politics, and a lobby organization on the EU level are associated with a significantly higher probability that an executive signs the pro-Euro appeal.[37] This corroborates the hypotheses of the social network approach but a puzzle remains: why did managers participate in this campaign if their firms did not benefit from it relatively? This study provides three explanations.

First, the significant association between network centrality among business-leaders and Euro campaign participation indicates that the campaigners had the informational resources to transcend the interest of the individual firm.

Second, the empirical analysis also indicates that a high social reputation and a career in government or politics partly explain participation. Since French and German political elites strongly supported the Euro, embeddedness in these social circles may have led to participation in favor of the Euro either through value internalization or through opportunistic behavior (e. g., fear of loss of social reputation, fear of antagonizing powerful decision makers with whom they frequently interact).

Third, the campaign may have been part of a broader framework of a repeated game in the political arena. Corporations with lobby resources at the EU level were more likely to become Euro campaigners because they might have expected to improve their access to political decision makers. This political capital did not turn out to be profitable in the short run but might help them to gain political influence in other, more firm-related, issues.

Consequently, this study confirms the findings of previous network studies that interlocking directorates are crucial to explain cohesive corporate political action. But it extends this research by pointing out that preference formation might have its origin in social networks outside of the corporate world.

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[37] These findings were confirmed in several robustness tests that included model specifications with robust standard errors, different samples, additional explanatory variables, different concepts to measure variables, the removal of the imputed values, and interaction terms as shown by Tables 5.4 and 5.5 in the appendix.

5.7 Conclusion

The political economy approach explains in solely economic terms business leaders' participation in the "Euro is necessary" advertising campaign. However, the empirical analysis suggests that participation in the pro-Euro campaign strongly depended on business executives' social environment. A central position in CEO networks, an award indicating social reputation, previous positions in government or politics, and political capital in the form of an EU lobby organization tended to substantially increase the propensity for cohesive political action among Franco-German executives in support of the Euro.

These findings do not imply that the political economy approach can never explain the political behavior of firms. In an environment with clear benefit structures, its predictions are reasonable and powerful. The empirical analysis shows that the significant relational variables are positively correlated with firm size, suggesting that it is easier for the CEOs of large companies to acquire high-quality contacts and/or that such companies are more likely to hire well-connected managers. Moreover, firm size strongly correlates with the presence of an EU lobby organization, indicating that firm size might be crucial to explaining the establishment of networks between business and government on the EU-level.

For a spontaneous influential strategy like the pro-Euro campaign, social network theory might explain why Franco-German managers participated even though their firms did not profit from it in the near term. Previous studies (e. g., van Veen and Kratzer 2011) show that the Franco-German business communities consist of densely connected network cores as confirmed by Figure 1. Their central position might permit these executives to better comprehend the perceptions of several sectors of the economy and to develop a better understanding of the broader perceived interests of large corporations.

They are also better connected to social and political elites. Members of these elites strongly supported the Euro, which could have let to the internalization of pro-Euro values among business directors. Moreover, since lasting relationships with important political decision makers depend on good working conditions, business leaders might had an incentive to disregard their short-term economic interest and supported the pro-Euro campaign to improve their political capital from which they might hope to benefit in the long run.

The broader implications for the study of corporate political behavior are that researchers should focus not only on the structural attributes of firms but also on the relationships

of business directors inside and outside of the business community. Perceiving businesses' interest is not an easy epistemological task in a world of uncertainty and this study provides evidence that the informational resources and ideological positions that business leaders acquire from others in their social networks could also shape their political decisions.

References

Alfarano, Simone, and Mishael Milaković. 2009. "Network structure and N-dependence in agent-based herding models." *Journal of Economic Dynamics and Control* 33(1): 78-92.

Andres, Gary J. 1985. "Business involvement in campaign finance: Factors influencing the decision to form a corporate PAC." *PS: Political Science & Politics* 18(2): 213-220.

Apeldoorn, Bastiaan. 2001. "The Struggle over European Order: Transnational Class Agency in the Making of 'Embedded Neo-Liberalism'." Pp. 70-89 in: Andreas Bieler and Adam David Morton (eds.): *Social Forces in the Making of the New Europe*. New York: Palgrave.

Bechtel, Michael M., and Gerald Schneider. 2010. "Eliciting substance from 'hot air': Financial market responses to EU summit decisions on European defense." *International Organization* 64(2): 199-223.

Beyers, Jan. 2004. "Voice and Access Political Practices of European Interest Associations." *European Union Politics* 5(2): 211-240.

Blyth, Mark. 2006. "Great punctuations: prediction, randomness, and the evolution of comparative political science." *American Political Science Review* 100(4): 493-498.

Blyth, Mark. 2009. "Coping with the black swan: The unsettling world of Nassim Taleb." *Critical Review* 21(4): 447-465.

Bond, Matthew. 2004. "Social influences on corporate political donations in Britain." *The British Journal of Sociology* 55(1): 55-77.

Bond, Matthew. 2007. "Elite social relations and corporate political donations in Britain." *Political Studies* 55(1): 59-85.

Bond, Matthew, Siana Glouharova, and Nicholas Harrigan. 2010. "The political mobilization of corporate directors: socio-economic correlates of affiliation to European pressure groups." *The British Journal of Sociology* 61(2): 306-335.

Borgatti, Stephen P. 2005. "Centrality and network flow." *Social Networks* 27(1): 55-71.

Borgatti, Stephen P., Martin G. Everett, and Linton C. Freeman. 2002. *UCINET for Windows: Software for Social Network Analysis*. Harvard, MA: Analytic Technologies.

Borgatti, Stephen P., and Pacey C. Foster. 2003. "The network paradigm in organizational research: A review and typology." *Journal of Management* 29(6): 991-1013.

Borgatti, Stephen P., and Daniel S. Halgin. 2011. "On network theory." *Organization Science* 22(5): 1168-1181.

Bouwen, Pieter. 2002. "Corporate lobbying in the European Union: the logic of access." *Journal of European Public Policy* 9(3): 365-390.

Brandes, Ulrik, and Christian Pich. 2007. "Centrality estimation in large networks." *International Journal of Bifurcation and Chaos* 17(7): 2303-2318.

Broz, J. Lawrence, and Jeffry A. Frieden. 2001. "The political economy of international monetary relations." *Annual Review of Political Science* 4: 317-343.

Bund der Deutschen Industrie. 2011. *BDI-Aussenwirtschafts-Report 03/2011*. Berlin: BDI.

Burris, Val. 2005. "Interlocking Directorates and Political Cohesion among Corporate Elites." *American Journal of Sociology* 111(1): 249-283.

Burris, Val. 2009. "Corporations, Capitalists, and Campaign Finance." Pp. 246-264 in: Kevin T. Leicht and J. Craig Jenkins (eds.): *Handbook of Politics: State and Society in Global Perspective*. New York: Springer Publishing.

Burt, Ronald S. 1987. "Social contagion and innovation: Cohesion versus structural equivalence." *American Journal of Sociology* 92(6): 1287-1335.

Büschemann, Karl-Heinz. 2011. "Deutsche Wirtschaft: Anzeigenkampagne Bitte, bitte, rettet doch den Euro." *Süddeutsche Zeitung*, 20 June.

Collignon, Stefan, and Daniela Schwarzer. 2003. *Private Sector Involvement in the Euro. The power of ideas*. London: Routledge.

Converse, Philip. E. 2006. "The Nature of Belief Systems in Mass Publics." *Critical Review* 18(1–3): 1–74.

Cowles, Maria G. 2001. "The transatlantic business dialogue and domestic business-government relations." Pp. in 159-179: Maria G. Cowles, James A. Caporaso and Thomas Risse-Kappen (eds.): *Transforming Europe: Europeanization and domestic change.* Ithaca: Cornell University Press.

De Boissieu, Christian, and Jean Pisani-Ferry. 1998. "The Political Economy of French Economic Policy in the Perspective of EMU." Pp. in 49-89 in: Barry J. Eichengreen and Jeffry A. Frieden (eds.): *Forging an Integrated Europe*. Ann Arbor: University of Michigan Press.

De Gregorio, Jose, Alberto Giovannini, and Holger C. Wolf. 1994. "International evidence on tradables and nontradables inflation." *European Economic Review* 38(6): 1225-1244.

Dinç, I. Serdar. 2005. "Politicians and banks: Political influences on government-owned banks in emerging markets." *Journal of Financial Economics* 77(2): 453-479.

Duckenfield, Mark, and Mark Aspinwall. 2010. "Private interests and exchange rate politics: The case of British business." *European Union Politics* 11(3): 381-404.

Emirbayer, Mustafa. 1997. "Manifesto for a relational sociology." *American Journal of Sociology* 103(2): 281-317.

Faccio, Mara, Ronald W. Masulis, and John McConnell. 2006. "Political connections and corporate bailouts." *Journal of Finance* 61(6): 2597-2635.

Fisman, Raymond. 2001. "Estimating the value of political connections." *American Economic Review* 91(4): 1095-1102.

Frankfurter Allgemeine Zeitung. 2011. "Der Euro ist notwendig." *Frankfurter Allgemeine Zeitung*, 21 June.

Frieden, Jeffry A. 2002. "Real sources of European currency policy: Sectoral interests and European monetary integration." *International Organization* 56(4): 831-860.

Friedman, Jeffrey. 2009. "A crisis of politics, not economics: Complexity, ignorance, and policy failure." *Critical Review* 21(2-3): 127-183.

Granovetter, Mark. 1985. "Economic action and social structure: The problem of embeddedness." *American Journal of Sociology* 91(3): 481-510.

Grier, Kevin B., Michael C. Munger, and Brian E. Roberts. 1994. "The Determinants of Industry Political Activity, 1978–1986." *American Political Science Review* 88(4): 911-926.

Hanneman, Robert A., and Mark Riddle. 2005. *Introduction to Social Network Methods.* Riverside: University of California.

Hansen, Wendy L., and Neil J. Mitchell. 2000. "Disaggregating and explaining corporate political activity: Domestic and foreign corporations in national politics." *American Political Science Review* 94(4): 891-903.

Hart, David M. 2004. "'Business' is not an interest group: on the study of companies in American national politics." *Annual Review of Political Science* 7: 47-69.

Henkel, Hans-Olaf. 2011. "Währungsunion: Es gibt ein Leben nach dem Euro." *Handelsblatt*, June 22.

Hillman, Amy J. 2003. "Determinants of political strategies in US multinationals." *Business & Society* 42(4): 455-484.

Hillman, Amy J., and Michael A. Hitt. 1999. "Corporate political strategy formulation: A model of approach, participation, and strategy decisions." *Academy of Management Review* 24(4): 825-842.

Hillman, Amy J., Gerald D. Keim, and Douglas Schuler. 2004. "Corporate political activity: A review and research agenda." *Journal of Management* 30(6): 837-857.

Höpner, Martin, and Lothar Krempel. 2004. "The politics of the German company network." *Competition and Change* 8(4): 339-356.

King, Gary, Michael Tomz, and Jason Wittenberg. 2000. "Making the most of statistical analyses: Improving interpretation and presentation." *American Journal of Political Science* 44(2): 347-361.

Knoke, David. 1990. *Political Networks: The Structural Perspective*. New York: Cambridge University Press.

Knoke, David, and Song Yang. 2008. *Social Network Analysis*. Los Angeles: Sage.

Krueger, Anne O. 1990. "The Political Economy of Controls: American Sugar." In: Maurice Scott and Deepak Lal (eds.): *Public Policy and Economic Development: Essays in Honour of Ian Little*. Oxford: Clarendon Press.

Kuran, Timur. 1997. *Private Truths, Public Lies: The Social Consequences of Preference Falsification*. Cambridge: Harvard University Press.

Laumann, Edward O., Peter V. Marsden, and David Prensky. 1983. "The boundary specification problem in network analysis." Pp. 18-34 in: Ronald S. Burt, Michael J. Minor, and Richard D. Alba. (eds.): *Applied Network Analysis*. Beverly Hills: Sage.

Marsh, David. 2011. *The Euro. The Battle for the New Global Currency.* New Haven: Yale University Press.

McKnight, Phillip, and Cyril Tomkins. 2004. "The implications of firm and individual characteristics on CEO pay." *European Management Journal* 22(1): 27-40.

Milaković, Mishael, Simone Alfarano, and Thomas Lux. 2010. "The small core of the German corporate board network." *Computational and Mathematical Organization Theory* 16(2): 201-215.

Milner, Helen V., and. 1996. "Internationalization and Domestic Politics: An Introduction." Pp. 3-24 in: Robert O. Keohane and Helen V. Milner (eds.): *Internationalization and Domestic Politics*. New York: Cambridge University Press.

Mitchell, Neil J., Wendy L. Hansen, and Eric M. Jepsen. 1997. "The determinants of domestic and foreign corporate political activity." *Journal of Politics* 59(4): 1096-1113.

Mizruchi, Mark S. 1982. *The American Corporate Network: 1904-1974.* Beverly Hills: Sage.

Mizruchi, Mark S. 1992. *The Structure of Corporate Political Action.* Cambridge, MA: Harvard University Press.

Mizruchi, Mark S. 1994. "Social network analysis: Recent achievements and current controversies." *Acta sociologica* 37(4): 329-343.

Mizruchi, Mark S. 1996 "What do interlocks do? An analysis, critique, and assessment of research on interlocking directorates." *Annual Review of Sociology* 22: 271-298.

Mizruchi, Mark S. 2007. "Political economy and network analysis. An untapped convergence." *Sociologica* 1(2): 1-27.

Moravcsik, Andrew. 1998. *The Choice for Europe. Social Purpose and State Power from Messina to Maastricht.* Ithaca: Cornell University Press.

Newman, Mark EJ. 2008. "The mathematics of networks." In: Steven N. Durlauf and Lawrence Blume (eds.): *The New Palgrave Dictionary of Economics*. Second Edition. Basingstoke: Palgrave Macmillan.

North, Douglass C. 1990. "A transaction cost theory of politics." *Journal of Theoretical Politics* 2(4): 355-367.

Olson Jr., Mancur. 1965. *The Logic of Collective Action: Public Goods and the Theory of Groups.* Cambridge: Harvard University Press.

Pfeffer, Jeffrey, and Gerald R. Salancik. 1978. *The External Control of Organizations: A Resource Dependence Perspective*. New York: Harper and Row.

Plümper, Thomas, and Vera E. Troeger. 2006. "Monetary policy autonomy in European non-euro countries, 1980–2005." *European Union Politics* 7(2): 213-234.

Rogowski, Jon C., and Betsy Sinclair. 2012. "Estimating the causal effects of social interaction with endogenous networks." *Political Analysis* 20(3): 316-328.

Santella, Paolo, Carlo Drago, Andrea Polo, and Enrico Gagliardi. 2009. "A Comparison of the Director Networks of the Main Listed Companies in France, Germany, Italy, the United Kingdom, and the United States." MPRA Working Paper 16397.

Schmidt, Vivien A. 2008. "Discursive institutionalism: The explanatory power of ideas and discourse." *Annual Review of Political Science* 11: 303-326.

Schuler, Douglas A., and Kathleen Rehbein. 1997. "The filtering role of the firm in corporate political involvement." *Business & Society* 36(2): 116-139.

Spence, Jacqueline (ed.). 1997. *The European Union: A View from the Top*. Waver, Belgium: EOS Gallup Europe.

Stigler, George J. 1971. "The Theory of Economic Regulation." *The Bell Journal of Economics and Management Science* 2(1): 3-21.

Stockman, Frans N., Rolf Ziegler, and John Scott (eds.). 1985. *Networks of corporate power: A comparative analysis of ten countries*. Cambridge: Polity Press.

Taleb, Nassim Nicholas, and Avital Pilpel. 2004. "On the Unfortunate Problem of the Nonobservability of the Probability Distribution." Unpublished Manuscript.

Tetlock, Philip E. 2005. *Expert Political Judgment*. Princeton: Princeton University Press.

Tomz, Michael, Jason Wittenberg, and Gary King. 2003. "CLARIFY: Software for interpreting and presenting statistical results." *Journal of Statistical Software* 8(1): 1-30.

Useem, Michael. 1984. *The Inner Circle*. New York: Oxford University Press.

van Veen, Kees, and Jan Kratzer. 2011. "National and international interlocking directorates within Europe: corporate networks within and among fifteen European countries." *Economy and Society* 40(1): 1-25.

Verdun, Amy. 2000. *European Responses to Globalization and Financial Market Integration*. London: MacMillan Press.

Wilts, Arnold. 2006. "Identities and preferences in corporate political strategizing." *Business & Society* 45(4): 441-463.

Woll, Cornelia. 2008. *Firm interests: how governments shape business lobbying on global trade*. Ithaca: Cornell University Press.

Wonka, Arndt, Frank R. Baumgartner, Christine Mahoney, and Joost Berkhout. 2010. "Measuring the Size and Scope of the EU Interest Group Population." *European Union Politics* 11(3): 463-476.

Yeo, Hee-Jung, Christine Pochet, and Alain Alcouffe. 2003. "CEO reciprocal interlocks in French corporations." *Journal of Management and Governance* 7: 87-108.

Yoffie, David B., and Sigrid Bergenstein. 1985. "Creating political advantage: The rise of the corporate political entrepreneur." *California Management Review* 28(1): 124-139.

Zaller, John. 1992. *The Nature and Origins of Mass Opinion.* Cambridge: Cambridge University Press.

Zaller, John. 2009. "A Political View of Political Ideology." Pp. 78-81 in: King, Gary, Kay L. Schlozman, and Norman Nie (eds.): *The Future of Political Science. 100 Perspectives*. New York: Routledge.

Appendix: Additional tables

Table 5.4: Robustness tests with alternative model specifications

Explanatory Variables	Support for Pro-Euro Campaign				
	1	**2**	**3**	**4**	**5**
H1: Stock Returns	-0.06		-0.05	-0.08	-0.05
	(0.07)		(0.08)	(0.10)	(0.08)
H2: European Sales	-0.01	-0.01	-0.03*	-0.01	
	(0.01)	(0.01)	(0.02)	(0.02)	
H3: Tradable Industry	0.23	0.33	0.25	0.55	0.30
	(0.57)	(0.58)	(0.68)	(0.84)	(0.65)
H4: Firm Size	-0.01		-0.00	-0.03*	-0.01
	(0.02)		(0.02)	(0.02)	(0.02)
H5a: CEO Corporate Network Centrality	0.14**	0.13***	0.16***	0.14***	0.14***
	(0.05)	(0.05)	(0.06)	(0.05)	(0.05)
H5b: CEO Extra-Corporate Network Centrality	0.12**	0.11**	0.10	0.08	0.12**
	(0.06)	(0.05)	(0.06)	(0.06)	(0.05)
H6a: Order of Merit	1.64***	1.63***	1.36**	1.76**	1.64***
	(0.60)	(0.60)	(0.66)	(0.71)	(0.60)
H6b: Political Career	1.19*	1.08*	1.58**	1.57*	1.17*
	(0.64)	(0.63)	(0.73)	(0.82)	(0.68)
H7: EU Lobby Organization	0.98*	0.87*	1.14*	0.87	0.98*
	(0.56)	(0.52)	(0.62)	(0.63)	(0.55)
France-Based	0.95	0.87	1.31	0.32	0.98
	(0.84)	(0.77)	(0.92)	(0.90)	(0.79)
Government Ownership	-0.01	-0.01	-0.02	-0.01	-0.01
	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
Firm Network	0.02	0.02	0.05	0.04	0.03
	(0.04)	(0.05)	(0.06)	(0.06)	(0.05)
Age of Director	-1.43***	-1.40**	-1.41**	-1.76***	-1.43***
	(0.57)	(0.55)	(0.62)	(0.68)	(0.56)
Age of Director – squared	0.01**	0.01**	0.01**	0.01**	0.01**
	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)
Domestic Sales					-0.01
					(0.01)
Non-Domestic European Sales					-0.02
					(0.02)
N	156	156	146	92	156
Log Likelihood	-56.55	-57.06	-46.94	-42.33	-56.49
AIC	143.11	140.13	123.87	114.66	144.98
BIC	188.86	179.78	168.63	152.48	193.78
Pseudo R^2	0.43	0.42	0.46	0.33	0.43

[continued]

Explanatory Variables	**Support for Pro-Euro Campaign**					
	6	**7**	**8**	**9**	**10**	**11**
H1: Stock Returns	-0.06	0.01	-0.06	-0.13	-0.10	-0.06
	(0.08)	(0.09)	(0.08)	(0.14)	(0.09)	(0.08)
H2: European Sales	-0.01	-0.01	-0.01	-0.01	-0.02	-0.01
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
H3: Tradable Industry	0.16	0.13	0.18	0.16	0.39	0.29
	(0.61)	(0.62)	(0.61)	(0.62)	(0.65)	(0.62)
H4: Firm Size	0.00	-0.00	0.00	-0.01	-0.01	-0.01
	(0.02)	(0.00)	(0.00)	(0.02)	(0.02)	(0.02)
H5a: CEO Corporate Network Centrality	0.13***	0.17***	0.13***	0.14***	0.13**	0.07
	(0.05)	(0.06)	(0.05)	(0.05)	(0.05)	(0.10)
H5b: CEO Extra-Corporate Network Centrality	0.11**	0.10**	0.10*	0.12**	0.12**	0.16**
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.07)
H6a: Order of Merit	1.59***	1.42**	1.59***	1.58***	1.77***	1.73***
	(0.60)	(0.61)	(0.60)	(0.61)	(0.63)	(0.62)
H6b: Political Career	1.23*	1.32**	1.26*	1.23*	1.29*	1.14*
	(0.67)	(0.67)	(0.67)	(0.67)	(0.69)	(0.68)
H7: EU Lobby Organization	0.89*	1.07*	0.85	0.97*	1.10*	0.96*
	(0.54)	(0.55)	(0.54)	(0.55)	(0.57)	(0.55)
France-Based	0.93	0.96	0.92	1.03	0.83	0.98
	(0.78)	(0.78)	(0.78)	(0.80)	(0.79)	(0.79)
Government Ownership	-0.01	-0.01	-0.01	-0.01	-0.01	-0.00
	(0.01)	(0.02)	(0.01)	(0.02)	(0.02)	(0.02)
Firm Network	0.02	0.02	0.01	0.02	0.04	0.02
	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)	(0.05)
Age of Director	-1.40**	-1.56***	-1.41***	-1.43***	-1.39**	-1.47***
	(0.56)	(0.56)	(0.55)	(0.55)	(0.56)	(0.56)
Age of Director – squared	0.01**	0.01***	0.01**	0.01**	0.01**	0.01**
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Financial Institution					0.89	
					(1.00)	
Size x CEO Corporate Network Centrality						0.00
						(0.00)
Size x CEO Extra-Corporate Network Centrality						-0.00
						(0.00)
N	156	156	156	156	156	156
Log Likelihood	-56.75	-55.61	-56.66	-56.32	-56.17	-55.98
AIC	143.49	141.21	143.32	142.65	144.33	145.95
BIC	189.24	186.92	189.07	188.40	193.13	197.80
Pseudo R^2	0.42	0.44	0.43	0.43	0.43	0.43

Note: * $p \leq 0.10$; ** $p \leq 0.05$; *** $p \leq 0.01$. The third model of Table 5.3 is re-estimated with the following changes in specification:

[continued]

Model 1	With robust standard errors.
Model 2	Stock Returns and Firm Size, which consist of imputed values, are excluded.
Model 3	Excludes 10 observations that have imputed values for Stock Returns and Firm Size.
Model 4	Includes only large cap firms (CAC40, DAX40) as negative cases.
Model 5	Separates European sales into Domestic Sales and Non-Domestic European Sales.
Model 6	Uses revenue as measurement for firm size.
Model 7	Uses assets as measurement for firm size.
Model 8	Uses number of employees as measurement for firm size.
Model 9	Uses returns from end of 20.07.11 to start of 22.07.11 to measure Stock Returns.
Model 10	Includes a dummy for financial corporations.
Model 11	Includes interaction terms for Firm Size x CEO Corporate Network Centrality and Firm Size x CEO Extra-Corporate Network Centrality

Chapter 6

Concluding Remarks

The studies of the dissertation contribute to issues in political economy that have emerged since the financial crisis of 2007-8, or were intensified by the subsequent global economic downturn. The highlights of the findings are the following:

Chapter 2 transcends the debate on the economic explanations of the surge in foreign reserves accumulation, which has contributed to global imbalances, by pointing out that acquiring reserves has a political dimension. The results show that democratic elections explain why authoritarian regimes have surpassed democracies in a period of massive reserves accumulation. Foreign reserves can be depleted to conduct an expansionary monetary policy without negatively affecting the exchange rate in the short-run, to support the national currency against depreciation pressures, or to fulfill clientelistic election promises. The reduction of reserves for these purposes is more likely before a democratic election because the democratic incumbent can improve his chances of re-election whereas an authoritarian ruler conducts elections that cannot be lost.

Chapter 3 has implications for the prospective liquidity requirements of Basel III, which will be implemented as a prudential measure against financial turmoil in the future. The study shows that the inflation rate only appears to be robust to changes in the velocity of money if reserve and liquidity requirements are low or non-existent. Since the velocity of money has become less predictable in recent decades, the liquidity requirements of Basel III could have negative consequences for monetary stability. In addition, the deregulation of reserve requirements appears to answer a puzzle in monetary theory that baffled the late Milton Friedman: Why did central banks – with their poor record of anticipating changes in velocity – achieve low and stable inflation rates exactly in a period of strong deviations in velocity? Central bank independence appears to be a necessary condition for price stability, but it seems to be low reserve requirements that ensure that the inflation rate are robust to changes in velocity: The optimal ratio of reserves holding by profit-seeking banks declines (increases), when velocity goes down (up). As a result of the exponential money multiplier effect, the banking sector can only sufficiently offset changes in velocity if reserve requirements are low or non-existent.

Chapter 4 suggests that government ideology still influences economic policy-making in the early 21st century when using a unified measurement of economic freedom that excludes policy areas that have been delegated from national governments, or that do not arouse partisan disagreement. The modified economic freedom score still covers a wide range of policy areas, including government expenditures, transfers, subsidies, privatization, government investment, income and payroll tax policies, and the regulation of labor and business. Left-wing governments are associated with significantly lower economic freedom in a sample of 36 OECD or new EU member states.

Chapter 5 analyzes a novel case of corporate political activity: A binational public campaign by major French and German corporations in favor of the euro shortly before a European Council meeting, which fulfilled most of the demands of the corporate pro-euro campaign. The study shows that French and German top executives were more likely to publicly support the euro when they were part of corporate and political networks, while the direct economic interest of their corporations played a negligible role. The results have broader implications for the study of rent-seeking. Corporations might not benefit directly from engaging in the political arena. But short-term political campaigns – which demonstrate ideological alliance with the political class – could still be beneficial for corporations in the long run because such campaigns foster the relationship with political decision-makers.

Curriculum Vitae

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